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Starting from research-based conclusions regarding the use of Educational Television (ETV) in colleges, and the premise that ETV is a new medium of instruction rather than just another method, this book tries to answer three questions: 1. Can a distinction be made between the consequences of students being taught by ETV and the consequences achieved by other teaching technologies? 2. Is there a systematic way in which the attitudes of college professors relate to the possibility that they may have to use ETV in their teaching; and 3. Is there a special student reaction to being taught by ETV compared with their reaction to the instructional technologies replaced by television instruction? Findings are that ETV is neither better nor worse intrinsically than the medium of instruction it replaces in achieving results among students, and therefore does not require an educational policy decision. Professors are responsive to ETV and will use it on an individual basis. ETV will tend to cause a redundancy in professors' teaching functions, but this will be compensated by a proportionate growth in their research functions. An extensive bibliography is appended. (GO)

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ROBERT DUBIN R. ALAN HEDLEY

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College Instruction by TV

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The Medium May Be Related To The Message

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The Medium May Be Related To The Message

College Instruction by TV

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with

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and

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Center for the Advanced Study of Educational Administration
University of Oregon Eugene, Oregon
1969

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It is still true that any change is a particular event which can be identified and isolated. . . . The nature, the causes and the consequences of a change . . . must be known by all those who undergo or participate in it. This is essentially an information problem. . . . The main problem is, however, to know what one is trying to obtain: should the change be tolerated, accepted, or desired?

A TOURAINE and associates
Workers Attitudes to Technical Change.
(1965), pp. 159-60.

Television is neutral; it is neither educational nor instructive; it is a means and not an end. It is simply an instrument that can be used to do certain kinds of educational jobs, and the quality and dimensions of these jobs are the primary consideration of educators who are interested in using TV. It cannot of itself perform important education functions, and it cannot be expected to do so.

C. R. CARPENTER
"A Perspective of Televised Instruction."
in John C. Adams, *et al.*, (eds.),
College Teaching by Television. (1958), p. 14.

Foreword

Among all teaching technologies researchers have probably investigated educational television (ETV) most extensively. We are therefore in a position to establish research-based conclusions regarding college-level utilization of ETV, and its consequences.

There have been several summaries of ETV research serving to bring together the findings of numerous studies around a central core of special analytical problems.

This analysis may be distinguished from its predecessors by the fact that it is organized around three analytical problems. We start with the obvious assumption that ETV is a distinctive technology for teaching. We are not, however, concerned with its technical features. What is most important is that educational television is a new *medium* of instruction, and not just another *method* of teaching. Given that ETV is a medium, clearly distinguishable from other teaching media, we want to answer these questions:

(1) Can we distinguish the consequences for students being taught by ETV, from the consequences achieved by other teaching technologies?

(2) Is there a systematic way in which the attitudes of college professors relate to the possibility that they may have to utilize ETV in their teaching?

(3) Is there a special student reaction to being taught by ETV when compared with their reaction to the instructional technologies replaced by television instruction?

The substance of this monograph is organized around the answer to these three questions. We start with a detailed and unique analysis of the outcome of employing ETV as an educational medium. Analytical attention then shifts to a concern with the innovation of a new teaching technology upon the attitudes of its potential users. The users, in turn, are divided between literal users—the professors, and consumers—the students.

The usual theories of resistance to innovation focus upon the direct *users* of the new technology. The standard ideas about response to new ways of behaving emphasize the conservative orientations of the people affected, and their probable resistance to adopting the new ways of acting. This leads to the conclusion that resistance to change may be overcome by manipulating the flow of information to those affected, and involving them in understanding and subsequently working out the applications of the change to their own behavior. Generally, the research supporting this position has been based upon simple innovations, whose technical features are readily grasped by the users.

These conclusions are far less firmly grounded when we deal with complex technical changes. College instruction by television is a complex technical change from usual methods of instruction.

Many facets of the technology of ETV are never learned by the TV teacher but remain the skills of numerous technicians associated with the production of a TV program. Thus, understanding many technical aspects of ETV may be irrelevant for the teacher-performer. Furthermore, many aspects of the teaching performance before the TV cameras may be dictated by the very technical considerations of which the TV teacher is necessarily ignorant. Therefore, the precept that those involved both understand and participate in designing their own new behavior may not be relevant to overcoming resistance to change to a more complex technology, like the change from lecturing to performing before the TV cameras.

We therefore need a different way of conceptualizing the users' responses to technical changes beyond their ken. We think the direct users respond in terms of faith rather than knowledge. There is usually a small group which has faith in the virtues of the proposed change and is willing to adopt the innovation on the basis of optimism. There is a much larger group of potential direct users who lack faith in the proposed innovation and may therefore either be indifferent to it, or actively resist its adoption.

Thus, college and university faculties may be divided between the fearful and the courageous in their attitudes toward and reactions about ETV. From the history of the very rapid spread of ETV among colleges and universities it would appear that the courageous professors prevail.

Most theories of technical innovation assume a polarization of *consumer* responses. The consumers of the innovation are likely, in the majority of cases, to be favorable in their orientation toward the innovation, according to the theoretical models. A conservative group among consumers may be viewed as being unwilling to use or consume the innovation.

We believe that there is a third orientation for consumers of technical innovations: that of indifference to the new technology. We find that among college students, who are the consumers of ETV, there is evidence of two kinds supporting the indifference hypothesis. A substantial proportion of college students exposed to ETV, in fact, express indifference with regard to it. In addition, however, the distribution of attitudes about ETV among students exposed to it is not substantially different from the distribution of attitudes of students exposed to the large lecture situation which is most frequently replaced by ETV. This is the second evidence of student indifference in reaction to the technical change in their instruction.

When we distinguish between the users and the consumers of a technical innovation we concluded that we needed several models of response in order to characterize reaction to the innovation. For any theory of technical innovation, and especially any theory dealing with technical educational innovation, this development should prove significant.

We introduce this monograph with an analysis of the comparative results in student learning from ETV and other teaching media. This parallels our analysis of comparative teaching methods in a companion monograph.[1]

The results of the comparative analysis of ETV and other teaching media are rather conclusive. Overall, the results appear to favor face-to-face instruction. However, when we introduce the appropriate controls on variation in the television medium by parcelling out the effects of one-way and two-way television instruction, the differences favoring face-to-face instruction are wiped out. It is two-way television instruction which is markedly inferior to face-to-face instruction! By virtue of that we can assert that "the medium may be related to the message" but in a manner perhaps different from the interpretive set with which each reader may have approached our title.

This study is then an analysis of technical innovation in college teaching media. Since the problem is not one of a distinct comparative advantage or disadvantage of the new medium of instruction over others, measured by student performance on examinations, it now becomes clear that the decisions to utilize or expand the use of ETV can be viewed as decisions regarding technical innovation. The educational decision maker does not, in accordance with the evidence, need to be concerned with major student learning trade-off required as a cost for introducing ETV.

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[1] Robert Dubin and Thomas C. Taveggia, *The Teaching-Learning Paradox: A Compartive Analysis of College Teaching*, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1968).

Put another way, the data seem to say that the end results of ETV are no better and very little worse than the technology it replaces. Accordingly, the educational decision maker and college administrator may treat the ETV problem as an issue in technical innovation rather than a controversy in educational policy. To the extent that this is clear, we feel this monograph makes a significant contribution to an understanding of educational TV as a medium for college instruction.

Dr. Michael Schmidbauer, sociologist and coordinator of research at the State Institute for Educational Research and Planning, Munich, West Germany, and Dr. Daniel R. Goldman, assistant professor of Sociology, Wayne State University, worked as members of the staff preparing this monograph, contributing to the initial draft of Chapters 2 and 3.

We are especially indebted to Thomas C. Taveggia who helped develop the computer program for making the comparative analysis of data reported in Chapter 1, and who made important suggestions regarding the substantive conclusions reached in that chapter.

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December, 1968
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CHAPTER

1

ETV May Be Just As Good (or Bad) As Other College Instructional Media

In order to know whether the struggle to introduce educational television is worthwhile, we should measure its effectiveness as an instructional medium. If we find, through comparative studies, that ETV is superior to other instructional media, then we will obviously want to hasten its introduction. If ETV is measurably poorer than other modes of instruction it should not be employed unless its known inferiority is taken into account. If there is no difference between ETV and other media, then the choice to utilize ETV will depend upon considerations other than its effectiveness as an educational tool.[1]

The conclusions of our comparative analysis are unequivocal. The initial differences favoring face-to-face instruction disappear when we control for the impact of two-way television. When, in more detailed analysis, the comparison goes against ETV, the addition of the simple control for the impact of two-way television wipes out this negative result. In the most intensive analysis across many studies yet made, we can find no evidence to dispute the conclusion that one-way television is as good as other college instructional media.

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[1] Throughout we will use ETV to stand for educational television. In a number of studies the technical term is closed-circuit TV (CCTV), instructional TV (ITV), and in the Oregon studies the designation is interinstitutional television (IITV).

Our results are based upon the analysis of the actual data contained in 42 comparative studies (out of 79 read and evaluated) in which a total of 348 comparisons are made between two classes of students, an "experimental" class taught by ETV and a "control" class receiving no television instruction. Our criteria for including these 42 comparative studies are as follows:

(1) Only comparative achievement of American college and university students taking courses for credit is measured;
(2) The comparisons must be based upon courses of at least one term duration;
(3) Comparisons must involve students receiving no televised instruction with students receiving some or all of their instruction by televison;
(4) Comparisons must be based on groups which have written identical tests or examinations;
(5) Comparative achievement must be reported in group mean scores (not G.P.A., letter grades, or group medians);
(6) Comparisons must be between groups that have experienced similar teaching *methods.*

Those studies not meeting all of these criteria, but still reporting comparative achievement on the college level, are included in the *Student Achievement Bibliography*—2.

In combining the data from the 42 studies meeting the above criteria we have employed only the course-content examination results expressed as group means, and the analysis rests on the amount and direction of difference in these group means. Also, in order to eliminate misleading redundancy from our results, we have utilized only 193 experimental comparisons which were judged to be independent of the total of 348 comparisons available in the 42 studies. Redundancy resulted when the identical experimental and control groups were compared more than once, i.e., on both a mid-term and final examination.

Media and Methods

A common distinction is made in the literature dealing with comparative instructional procedures. This is the distinction between media and methods. We may define an instructional medium as a total configuration of the technology and interaction between teaching and learning. Two media would be distinguished from each other if there were obvious and measurable differences in their respective configurations. Thus, face-to-face instruction is a medium distinguishable from instructional television. Both of these, in turn, may be distinguished from computer-assisted instruction as a third medium. Not only do the technical characteristics of the configuration vary among these three media, but the particular teaching inputs and the singular learning inputs may also be distinguished among them.

A teaching method, on the other hand, is a recognizable procedure employing a given medium of instruction. Thus, a straight lecture versus a discussion method represent two variations within the medium of face-to-face teaching.

It is essential, in trying to determine the relative merits of a medium, as we are doing in evaluating educational television, to be reasonably certain that we are not confounding media with methods. If we propose to contrast the medium of face-to-face instruction with ETV, then it is essential to insure that possible variations in teaching method do not confound the media comparison.

We do not think that this dual impact of media and method has been adequately controlled in past reviews of the literature contrasting educational television with other media. Consequently, our first task in marshaling the data as a basis for making our comparative analysis consisted of a careful reading of each study to determine that similar or identical teaching methods were employed in utilizing the several media being contrasted. This led us to discard a number of comparisons on the grounds that variable methods of instruction were used in the comparison between the media.

It is important to understand this procedure for we believe that none of the previous summaries of the field undertook to hold constant teaching method in order to insure that this variable did not confound the media comparisons. One of the important results of our study following this procedure was to provide an opportunity to make a detailed analysis of differences among media for particular teaching methods. Thus, for example, we will demonstrate that when a lecture is used in both face-to-face instruction and in the ETV medium, the former appears to produce superior results until we parcel out the effects of two-way TV, after which there is no difference between the two media.

Simplified Summarizing

When contrasts are made among two or more outcomes, a useful and rapid method for determining what the data from several studies of a field reveal is to sort the results into three categories. Thus, TV instruction and other forms of instruction may be compared in a series of studies. The summarizer proceeds to add up, in three categories, the empirical results of each study. These three categories consist of a central category of differences that are so small as to be statistically nonsignificant; and two other categories, each of which reports the number of instances in which one or the other group being compared is favored.

Now it is very clear that the central category, usually reported as "no significant difference," is a very broad category indeed, for with a unimodal distribution, the number of differences that are not significant is greater than the number of values for the significant differences on each side of a zero difference mean.

This simplified histogram is likely to be very insensitive as a way of measuring differences over a large body of data. This becomes particularly true as the volume of data reaches the level with which we are operating in contrasting ETV with other college teaching media. We, therefore, chose another analytical procedure.[2]

Standardized Comparisons

The actual procedures used in making the comparisons are explained in detail in the source indicated in footnote 2. To summarize, we have used two different sets of statistical procedures: an analysis of "signed" differences in mean group performances; and an analysis of standardized differences in mean group performances. In choosing these statistical procedures we were guided primarily by limitations of the available data.

The available data fell into two categories. A number of studies reported only the mean performance scores of the groups of students being compared. These data could only be used to determine that one medium produced better examination results than another, or that there were no differences. The magnitude of the differences was unimportant, and the characteristics of the distribution of individual scores upon which the means were based were not reported. Such data are imprecise, and allow us only to determine, over many studies, whether one medium is favored in a gross sense.

---

[2] The details of how the measures were computed are contained in Appendix A of a companion monograph: Robert Dubin and Thomas C. Taveggia, *The Teaching-Learning Paradox: A Comparative Analysis of College Teaching,* (Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1968).

In order to make full utilization of the data from the examination results (sacrificing precision of measurement for breadth of coverage) the signed difference was computed for every comparison in the 42 studies presenting comparable data, and the results were combined for each type of comparison. These gross results are presented in the upper portion of FIGURES 2-13 in this chapter. We do not, however, base our conclusions on these statistics, for while they are more precise than the simplified summarizing usually employed, they lack the essential feature of standardization.

A second group of studies presented data on the distribution of scores (means, standard deviations, t-ratios and sample sizes) for the groups compared. With these data in hand we were able to use or calculate a t-ratio as a standardized score measuring performance differences between two groups of students subjected to different media instructional treatments. After the t-ratios had been secured for each comparison, a histogram of the t-values was drawn. This histogram, together with the accompanying statistics describing the histogram is presented in the lower portion of FIGURES 2-13. A final procedure consisted of computing a standard difference of means test (t-test) in order to secure an approximate idea of whether the mean of the histogram deviated from a "true" difference of zero. If it did, then the direction of difference would represent the medium of instruction favored in the comparison.

Finally, it should be noted we chose to refine our analysis by basing our conclusions only upon those comparisons we considered to be independent. An independent comparison limited us to the choice of only one comparison between any two groups although more were often reported. Thus, mid-term and final examination results might be reported for two groups being contrasted. Since the same groups are being compared several times, the multiple comparisons are not independent of each other. We, therefore, chose to use only the final examination results to insure independence of all sample results entering into our summaries.

The footnote to each figure in this chapter reports the gross results derived from the total comparisons available in all 42 studies (independent and non-independent) where signed differences could be found or calculated. This permits comparison with other studies summarizing the field for they typically do not limit their conclusions to the independent sample comparisons. We emphasize again that our conclusions rest only upon the data derived from independent comparisons.

To summarize, our measure of differences takes into account the distinction between methods and media of instruction, employs standardized measures for each comparison, and is limited solely to those comparisons we considered to be independent of each other.

Progressive Analytical Scheme

The basic unit of analysis is a single independent comparison between two groups subject to two different instructional media treatment. We have many more comparisons than we have total studies because most studies contain more than one independent comparison.

Fortunately, there are enough comparisons in our entire study that we were able to move progressively from the most general comparison to more detailed ones. As already indicated we included only independent comparisons in which the methods were matched for the two media of ETV and face-to-face instruction.

In step 1 of our analysis we compared all results for the matched methods combined. This provides us with the gross view of how well ETV fares against the face-to-face medium of instruction.

The second step in the analysis was to answer the question of whether the medium variations in educational television produced any measurable consequences. Here we wanted to know if one-way and two-way television instruction differed in the results produced, when each variation on the television medium is compared with face-to-face instruction.

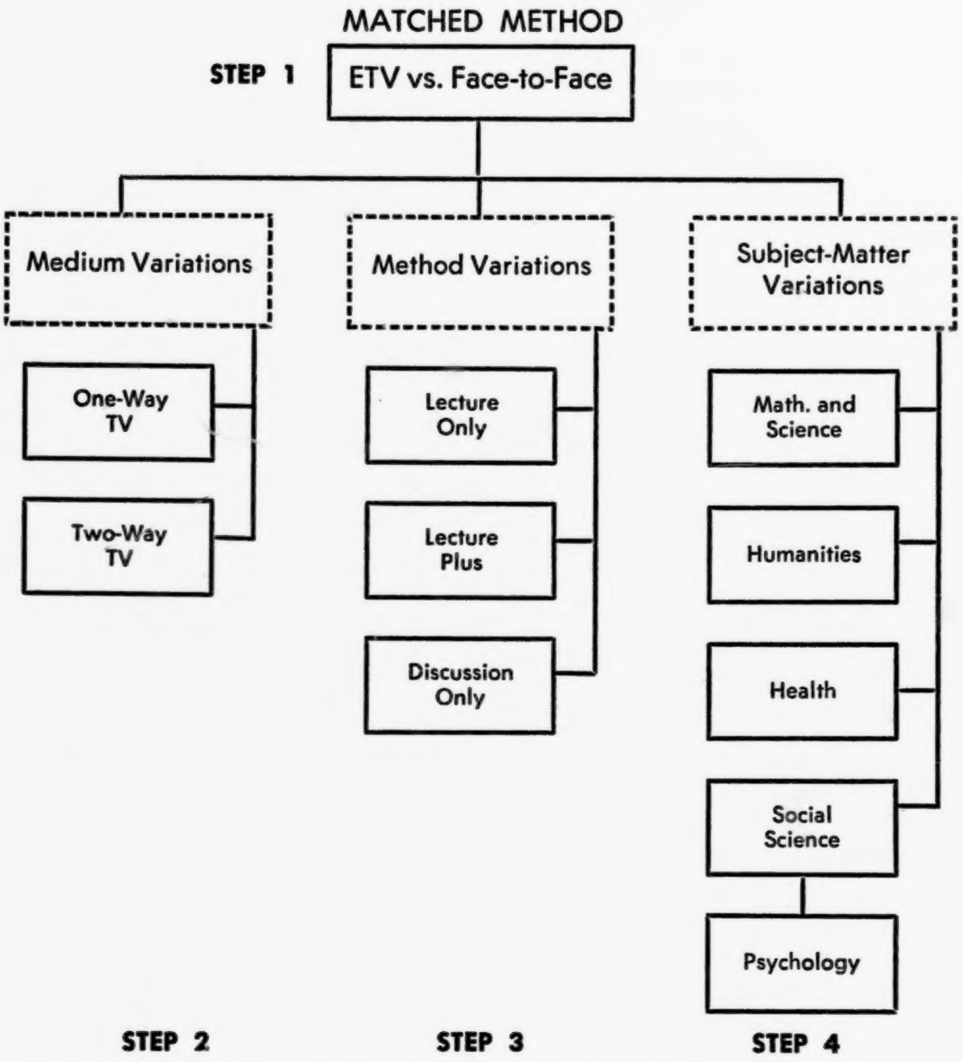
The third step in the analysis was then to examine whether holding constant the particular matched method of instruction produced any results different from those obtained in step 1. Thus, in step 3 we segregated all comparisons in which lecture only was used and examined what the results were when we contrasted ETV with the face-to-face medium of instruction. The identical procedure was followed to compare the media for the method variations of lecture plus discussion or demonstrations, and also for instruction by discussion only.

Since there is in the literature dealing with educational television some indication that the medium is employed more readily in some subject areas than in others, we proceeded to the fourth step in our analysis by sorting our comparisons according to subject-matter. In this analysis we were able to answer such a question as: "Is ETV better or worse than face-to-face instruction when teaching a social science course?"

Our results are presented in the order of the four steps just outlined and may be observed graphically in FIGURE 1. In so doing we exhausted

FIGURE 1

Progressive Analytical Scheme


MATCHED METHOD
STEP 1
ETV vs. Face-to-Face
Medium Variations
Method Variations
Subject-Matter Variations
One-Way TV
Two-Way TV
Lecture Only
Lecture Plus
Discussion Only
Math. and Science
Humanities
Health
Social Science
Psychology
STEP 2
STEP 3
STEP 4

the range of possible analytical steps available with the data from which we were working.

College ETV Less Adequate Than at Lower Levels

There is a hint in two of the summaries of educational television experiences that what happens at the college level and at lower levels of instruction is not the same. Kumata, in an earlier review of comparative studies has concluded: "If we look at studies conducted at the grade school, high school, and university levels, we find that TV shows superiority at the lower levels."[3] In the following year Schramm summarized comparisons of ETV with conventional instruction and also reached the conclusion that TV was less effective at the college level than at the lower levels.[4]

The most recent summary by Chu and Schramm supported this same conclusion.[5] In attempting to speculate as to why ETV was less effective at the college level than in high school and grade school Chu and Schramm wrote as follows:

> ... television instruction is apt to be more effective in teaching primary and secondary school students than college students. In the absence of more evidence, we can only speculate as to why this may be so. One possible reason could be the lack of immediate feedback in televised teaching. We might assume that the higher the grade level, the more complex the material taught, the more serious will be the lack of immediate feedback and discussion....
>
> Another possible factor is the role of television in the environment in which the students are brought up. We might assume that the younger the children, the more intimately has television been part of their experience of growing, and the more readily they will be able to learn from this medium.
>
> A third possibility is the different preferences for the media by different age groups. For instance, Ames got the impression after his visits to instructional television in ten big cities that the TV teacher usually has a special prestige value for younger pupils, and thus may be able to stimulate and motivate learning....
>
> Finally, we must consider the attitude of the teacher. Any school administrator knows that the classroom teacher can have either a facilitating or a hindering effect on learning aids brought into the classroom. Undoubtedly the secondary school and college teacher is apt to be more defensive about sharing his classroom with a televised teacher from outside, and less willing to surrender his right to conduct the lecture and demonstration parts of a course .... [6]

We start our analysis with the established belief that the results of college-level television instruction are less successful than are the results of using the medium at lower levels of schooling. If the effectiveness of

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[3] Hideya Kumata, "A Decade of Teaching by Television," in Wilbur Schramm (ed.), *The Impact of Educational Television.* (Urbana, Ill.: University of Illinois Press, 1960), pp. 179-80.

[4] Wilbur Schramm, "What We Know About Learning From Instructional Television," in *Educational Television: The Next Ten Years.* (Stanford, Cal.: Stanford University, Institute for Communication Research, 1962), p. 54.

[5] Godwin C. Chu & Wilbur Schramm, "Learning from Television: What the Research Says," (Stanford, Cal.: Stanford University, Institute for Communication Research, 1967), p. 13.

[6] *Ibid.*, pp. 13-14.

ETV declines as we move to higher levels of education, then it may also prove to be less effective than face-to-face instruction when utilized at the highest levels of education. This immediately calls attention to the desirability of direct evaluation of ETV relative to the instructional medium it replaces in college teaching.

Face-to-Face Instruction Has an Over-all Advantage Over ETV

In FIGURE 2 we sort the data for the general comparison between face-to-face instruction and ETV. (See page 18.) As previously noted this comparison depends upon independent measures where in each instance the same teaching method was employed in the face-to-face and television situation.

A statistical test of our distribution of standardized scores, the t-ratios, indicates that the mean value of the t is in the direction favoring face-to-face instruction. This mean value deviates from a mean of zero for the distribution at a significant level ($P < .05$). It will be noted that the distribution has a rather small standard deviation which means that the cases are concentrated around the midpoint of the distribution. Indeed, the extent to which the data are bunched at or near the mean is revealed by the fact that in our refined sign test, there are 102 comparisons favoring ETV and only 89 favoring face-to-face instruction. Thus, if we had done only as previous summarizers of these data had done we might very well have concluded that the evidence warrants the belief that television instruction is indeed superior. We emphasize this simply to point out the insensitivity of any sign test and the desirability of securing an actual distribution of the standardized measures of differences, as we have done.

Our results differ from those previously reported in the literature for they tended to emphasize the "no difference" findings of the individual studies and only used a simplified sign test to report proportions significantly favoring ETV or face-to-face instruction. We are confident that our results are more accurate than those previously summarized. Indeed, we did a separate analysis to discover whether the results were in any way influenced by a single study or several studies that might have dominated the array of data. We did find one study, the Los Angeles City and Valley College study (Study #102 in the *Student Achievement Bibliography*—1) which accounted for 25 of the independent comparisons from which t-scores could be obtained in this first step analysis, 25 of 63 independent comparisons when we examined the lecture only method of instruction, 25 out of 26 of the two-way TV results, and 10 out of 20 of the results reported for the teaching of health. We are satisfied that this is one of the best studies in the literature from a methodological standpoint and that the only influence this study has is to contribute data in which we have a high level of confidence.[7]

We therefore start analysis with the most general finding based upon almost 200 independent comparisons for the sign test, and almost 100 independent comparisons for the test based upon our standardized scores.

Were the analysis to stop here, the conclusion must be: face-to-face instruction is favored over ETV by a statistically significant amount which is of relatively small magnitude.

Fortunately we are able to move on to three more detailed stages of analysis as we have indicated in FIGURE 1.

Face-to-Face Instruction Is Better Than Two-Way but No Better Than One-Way ETV

We had some suspicion that the form of the television medium employed might make a difference in the results measured in student examination performance. The usual criticism of television instruction is that it does not permit any sort of immediate and direct feedback from students to professor because there is no opportunity to ask questions, or enter into a dialogue with the professor and the class. In response to this general criticism, technologies were utilized to permit two-way television instruction. Two-way instruction provides the audio facilities by which students may engage the television lecturer immediately, or at least during the same broadcast period. There are obvious technical difficulties in achieving this and a certain newness of style required by both students and professor to adapt to the technical apparatus necessary to achieve two-way television instruction. We, therefore, had some reason to believe that maybe the adaptation to this sophisticated and sometimes complex technology might have detracted from the student learning and subsequent performance on examinations.

---

[7] Following is a description of the procedures used in this study:

> "... each student's standard score on a group test of academic aptitude, integrated with his standard score on a pre-test of knowledge of subject matter of the course, formed a factor which was held constant. For the first three semesters ITV and control classes were evaluated by making matched grouped comparisons. For the final two semesters groups were not matched directly. ITV and control classes were given a pre-test of knowledge of subject matter. By applying analysis of covariance techniques it was possible to correct for, or 'hold constant,' differences in the groups due to variations in background for the course, i.e., to 'match' the groups. At the end of the course, therefore, one could be confident that presence or absence of statistically significant differences in achievement between ITV and control groups was due to classroom experiences, and not to sampling errors." (p. 9)
>
> "The fact that achievement of Los Angeles ITV students has remained essentially unchanged and at par over the five semesters of the experiment leads one to retain confidence in the results. ..." (p. 16)

"An Evaluation of Closed-Circuit Instruction Television in Los Angeles City College and Los Angeles Valley College: Final Report," (Los Angeles: Los Angeles City School Districts, Division of Extension and Higher Education, 1959).

In FIGURE 3 we present the analysis of the data showing only the results obtained when one-way television was contrasted with face-to-face instruction. (See page 19.) It is clear from the data that the distribution of results have a mean which does not deviate significantly from a zero value, and we may, therefore, conclude that there are no differences between face-to-face instruction and one-way television instruction. Here again we demonstrate the superiority of the actual standardized scores analysis over a sophisticated sign test because the sign test shows that one-way television is favored in 94 comparisons and face-to-face instruction in only 62 comparisons.

When we turn our attention to two-way television instruction the results are quite opposite. The data are shown in FIGURE 4. (See page 20.) It is very clear that face-to-face instruction is superior. The mean of the standardized scores is clearly in the direction of face-to-face instruction and significantly different from a zero mean ($P < .001$).

We now have a rather surprising result. The expectation that television instruction would be improved by two-way communication in order to provide as nearly as possible the replication of the live lecturing situation is simply not realized. Two-way television so far has not worked and it is significantly inferior to face-to-face instruction.

Since holding constant the medium variations for ETV demonstrated that one-way television was as good as face-to-face instruction but that two-way television was markedly inferior to it, we are now in a position to re-evaluate our original finding favoring face-to-face instruction. Apparently our initial result was achieved because two-way television was so bad that by comparison all television instruction was pulled down to the level that made comparative face-to-face instruction superior to it.

We have here completed step 2 of our analysis and it should now be clear that we can no longer be quite so certain that the contrast between the two media favor one over the other.

When Lecture Is Employed in Both Media, Face-to-Face Instruction Is Superior Only to Two-Way ETV

We now divide the 93 independent comparisons for which we have standardized scores into two groups: the first being one in which only lectures were employed in each media; and the other being a teaching situation in which lecture was combined with small face-to-face discussion sections, laboratory sessions, or live demonstrations sessions. We here examine the "lecture only" situation.

A glance at FIGURE 5 and the accompanying statistics makes very clear that face-to-face instruction is highly favored over ETV when a straight lecture method is employed in each medium. (See page 21.) The mean of the standard scores deviates significantly in favor of face-to-face lecturing ($P < .001$). In this instance even the sign test among the independent comparisons favors face-to-face lecturing over television lecturing by almost 56% to 42.5%.[8]

A careful reading of the literature on educational television might well have led to the prediction of these results. There is a neat and important distinction drawn in the literature between televised instruction and instructional television. Televised instruction simply repeats on the television screen what normally happens in the lecture hall. The camera picks up a professor lecturing as he would "live." The only dimension added by television broadcasting is that the audience becomes unlimited in size, unrestricted in location, and scheduled for listening at any time a video tape may be broadcast of the original live performance.

By contrast, in instructional televison an attempt is made to design the performance to use the visual potentialities of television as an integral part of the instructional process. Instructional television may, therefore, significantly modify the performance aspects of lecturing, and produce a learning retention effect, measurable on examinations, that reflects the combined audio and visual impacts of the instructor's performance.

We might, therefore, predict that if all that is being projected on the television screen is a professor lecturing, and assuming equal student propensity to attend a live lecture and a televised lecture, that there might be some tendency toward more inattention before the television screen. This might lead to the conclusion that students instructed by ETV by straight lecture methods might do more poorly on examinations than those who had received the same materials in a live lecture. This is, of course, pure conjecture based upon an assumption as to the relative attention-commanding qualities of the two media.

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[8] It will be noticed that the sign test is based on 127 comparisons whereas the histogram is based on 63 comparisons. The difference is due to the fact that we were able to find 127 comparisons which we considered independent that reported direction of differences and/or magnitude of difference but did not provide sufficient statistical information to calculate the t-scores. In the 63 cases we were able to make the full analysis.

How wrong this conjecture can be is readily revealed when we turn back to the results already known to us from the comparison of one-way and two-way ETV. If two-way ETV was so really bad then could this fact alone tip the balance against television instruction when the lecture method is employed? The answer is definitely "Yes."

In FIGURE 6 we present the analysis of lecturing face-to-face and lecturing via one-way television. (See page 22.) There is no longer any significant advantage for face-to-face instruction. It is easy to check visually the impact of two-way television since its results are represented by the difference between the shaded histogram in FIGURE 6 and the histogram made by the dotted outline. Clearly, the two-way television results are inferior to face-to-face lecturing.

The evidence is now very strong that even if we limit the analysis to a single method of instruction—lecturing—the only circumstance under which face-to-face teaching is superior to television teaching is when the two-way television medium is used. Since this is the exceptional rather than the typical manner in which ETV is utilized, we feel confident in the conclusion that one-way ETV and face-to-face instruction produce the same results with the lecture method. We have more analysis to present but the conclusion that only two-way ETV produces results detrimental to television instruction will remain unchallenged.

With a Lecture Plus Method There Are No Significant Differences

In FIGURE 7 we present the data on those comparisons where some kind of live instruction in a discussion section, demonstration, or laboratory period, was combined with one or more lectures. (See page 23.) The mean of the distribution of standard scores does not deviate significantly from a zero mean. This is interpreted to mean that the "true" difference between the two media of instruction is a zero difference.

We are then forced to the conclusion that when some live instruction is combined with televised instruction, ETV is no longer inferior to face-to-face instruction. Indeed, it will be noted that the mean of the distribution actually favors television and if the sign test is examined it is very clear that television instruction is favored in about 72% of the cases and face-to-face instruction is favored in only 28% of the comparisons. (See FIGURE 7.)

We found one study in the literature in which an ingenious comparison was made between the two media by employing a discussion method in both.[9] There was only enough data in this study, the group means being reported, to make a sign test. Among the 14 comparisons, 7 favored face-to-face instruction and 7 favored television instruction.

The evidence seems very clear from our third-step analysis. When we equate the teaching methods so that what we are really comparing is face-to-face instruction with ETV, there remains only one basis for claiming superiority for the traditional instructional medium. Face-to-face is superior only to two-way ETV in the lecture method. Otherwise, one-way ETV is just as good as face-to-face teaching by lecturing, a combination of lecturing and discussion or demonstration, and even when discussion alone is employed. We still feel confident that the title of this chapter is accurate. The evidence still remains to be examined for the possibility that subject matter may make a difference in the comparative effectiveness of ETV.

There Is No Difference When Course Content Is Held Constant

The final step in our analysis is to examine the differences between face-to-face instruction and ETV when we group the results according to the broad areas of course content to which they relate. There were enough data to group the research results into three broad categories of the humanities, the social sciences, and the combination of science and mathematics. There were also sufficient data for the field of psychology to make a separate analysis of the results there. Finally, we had four studies presenting the results of the teaching of health; these data are presented separately. For the major subject matter comparisons there are no significant differences between the two media of instruction. Only in the case of the teaching of health does the face-to-face medium seem to be superior to television instruction, the inferiority of two-way ETV producing this result.

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[9] Following is the description of the procedure:

"Group One consisted of fourteen students who met with the instructor in the television studio [and] were on camera, both their images and voices being relayed, via closed circuit television, to monitors to other rooms. Groups Two and Three were in two of these other rooms. There they could see and hear what was going on in Group One and could communicate with Group One and with each other. Group One, however, could see neither of these Groups. Thus discussion could be carried on among the three Groups and Groups Two and Three could see Group One in action.... Normally, the burden of responsibility for discussion fell on members of Group One, but the instructor often called on students in the other two groups and, of course, welcomed volunteers.... Students in Groups Two or Three indicated a desire to enter the discussion by raising their hands. The proctor would indicate this to the instructor by pressing a button which would flash either a red or white light (depending on which group wanted to be heard) and the instructor would call upon that room. The student would then identify himself and proceed to talk." (p. 7)

"One section of students (twenty-seven the first semester, twenty-four the second semester) was placed in a room in which Group One could be seen and heard via the television monitors and the discussion among Groups One, Two, and Three could be heard. Members of this group could *not*, however, participate in the discussion." (p. 8)

Samuel L. Becker, James N. Murray, Jr., and Harold P. Bechtoldt, *Teaching by the Discussion Method*, (Iowa City: State University of Iowa, 1958).

Starting first with the humanities, you will note from FIGURE 8 that the mean of the distribution of standard scores does not deviate significantly from a zero mean difference. (See page 24.) The distribution of actual values is somewhat unusual for those favoring face-to-face instruction concentrated close to the mean of the distribution, where those favoring television instruction are more widely dispersed. In the sign tests of the comparison of the media for the humanities, television instruction was favored in 40 comparisons and face-to-face instruction in only 23. In this and the succeeding comparisons it must be remembered that we have not controlled for the variations between one-way and two-way television instruction, except for the teaching of health.

Turning attention to the social sciences, FIGURE 9 displays the data for the independent comparisons. (See page 25.) Here again it will be noted that the mean of the distribution of standardized scores does not deviate significantly from a "true" mean of zero. The sign test favors face-to-face instruction but, as we have already pointed out several times, the sign test is far less exact than our statistical test based upon t-ratios.

We had included psychology in the social sciences (no invidious assignment intended for those who prefer to classify the discipline in the natural sciences) and there were enough comparisons to permit us to treat psychology as a separate subject matter. The data are presented in FIGURE 10 and again we discover that the mean of the distribution of differences between the two media does not deviate significantly from a zero mean. (See page 26.) There is no reason to believe that students taught psychology by television instruction will do any better or worse than those taught by face-to-face instruction.

When we combine all the courses that fall within the mathematics and science area, as is done in FIGURE 11, it is clear that there is no difference between the two media of instruction. (See page 27). Indeed, we get a remarkable symmetry in the results for the math and science comparisons with 11 of the total of 25 comparisons falling in the class interval which has its center at a zero difference. Certainly, for this subject area, the shape of the distribution as well as the statistical test of its mean makes very strongly evident the conclusion that there is no difference between ETV and face-to-face instruction.

We come finally to the last subject comparison, that of health. (See FIGURE 12, page 28.) The four studies in this area yielded 20 independent comparisons for which we had sufficient statistics to calculate the distribution of t-ratios. The results favor face-to-face instruction with the mean difference in the distribution deviating significantly from a zero mean difference ($P < .02$).

We are now sensitized to the need to turn back to the ETV medium variations when we find a significant result differentiating face-to-face instruction and television teaching. This we do for the teaching of health in FIGURE 13. (See page 29.) The mystery as to why health should produce better results when taught face-to-face disappears, since the outcome can be accounted for by the inadequacy of two-way ETV (the results to be interpreted exactly as we did when analyzing lecturing).

Our results have remained consistent through three stages of detailed analysis after first establishing what looked like a strong conclusion that ETV was inferior to face-to-face instruction when results are measured by student performance on examinations. We can only say that face-to-face instruction is superior to two-way ETV, no more. Neither variations in the teaching methods employed, nor the subjects taught can shake this conclusion.

The Difference Is Real but Specialized

We started with some promising results that led us to the conclusion that face-to-face instruction is better than televised instruction. However, when we turned attention to variations in the television medium we discovered that the apparent reason for the face-to-face instructional superiority lay in the distinct inferiority of two-way television instruction. When we limited attention only to one-way television instruction it was not demonstrably inferior to face-to-face teaching. We found nothing in our analysis by teaching methods and subject matter taught that led us to a conclusion other than that there was no measurable difference between the two media.

Our overall evaluation is that the issue is not entirely settled. We do think that the evidence points to two-way television instruction as being definitely detrimental. It simply does not measure up to comparable face-to-face instruction. This is a curious certitude in the results because the motivation to introduce two-way television was precisely to replicate as nearly as possible the live instructional situation. Perhaps, indeed, the medium is related to the message, as McLuhan asserts, and because two-way television tries to be live (therefore the "other" medium) it fails to get across its instructional content.

Implications for Technical Innovation

When there is something really new under the sun it is likely to be received by consumers with interest, if not enthusiasm. This is especially true if that which is new is demonstrably, or is anticipated to be, superior to that which it replaces. The potential users of an innovation are likely to be receptive to the degree that the innovation is definitely better than presently used techniques or technologies.

There is no difficulty in recognizing educational television as a unique and different medium of instruction. There is a great deal of difficulty in proving that it is any better or worse than face-to-face instruction.

We are thus confronted with a highly visible technical innovation, the intended consequences of which are neither better nor worse than the technology it replaces. Under these circumstances it is especially important to examine the attitudes of actual and potential users and consumers of the innovation. Their outlook may very well make the single most important difference in whether the innovation will be adopted, and if adopted, whether it will be successful.

For that reason we devote the remainder of this monograph to examining the evaluations of ETV by professors (the users) and college students (the consumers).

(FIGURES *2 through 13 which are mentioned in this chapter appear consecutively on pages 18-29.*)

FIGURE 2

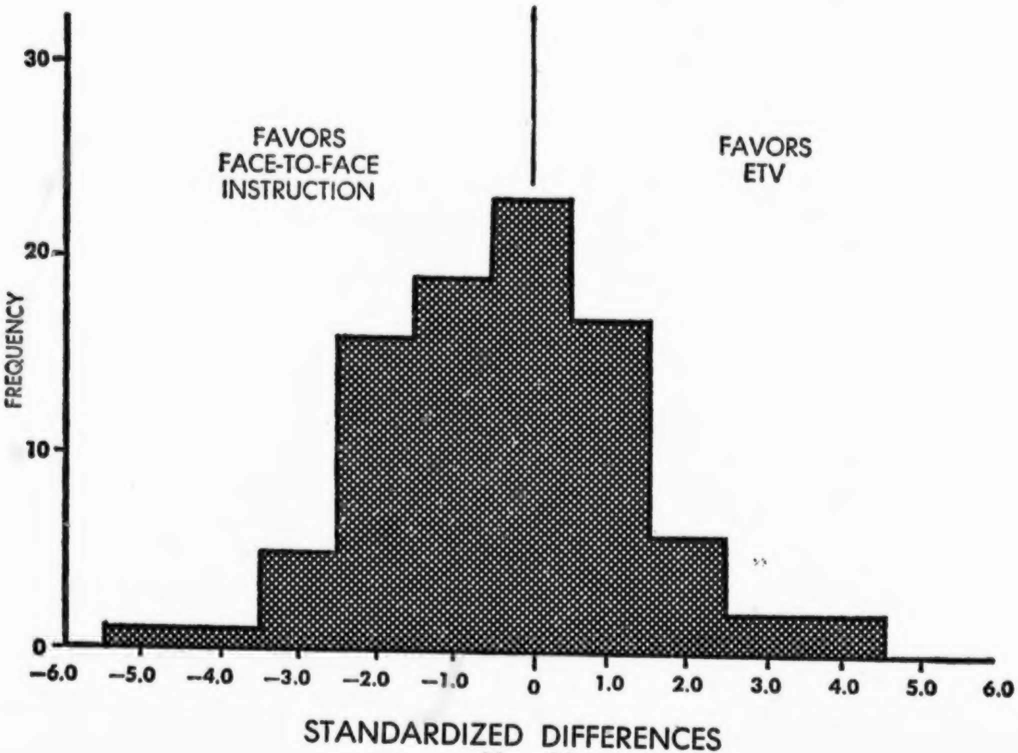
Face to Face Instruction Is Better Than ETV Overall

(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	89	46.1
Favors ETV	102	52.9
Shows No Difference	2	1.0
TOTAL	193	100.0

Studies:** 091, 092, 093, 094, 098, 099, 101, 102, 104, 105, 106, 109, 111, 112, 113, 115, 117, 118, 120, 124, 126, 127, 128, 129, 130, 132, 135, 136, 138, 140, 142, 144, 145, 146, 147, 148, 150, 156, 160, 163, 166, 167.



STANDARDIZED DIFFERENCES
N = 93
MEAN = −0.37
SD = 1.63
t = 2.19 .05 > P > .02

Studies:** 98, 99, 102, 105, 111, 112, 113, 115, 117, 118, 120, 124, 126, 127, 130, 140, 142, 147, 160, 163, 166, 167.

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* A grand total of 348 independent and non-independent comparisons were found for which 50.0% favor face-to-face instruction, 48.8% favor ETV and 1.2% show no difference.

** The full citation to source is identified by study number in the **Bibliography** related to the special subject of this and each succeeding Figure.

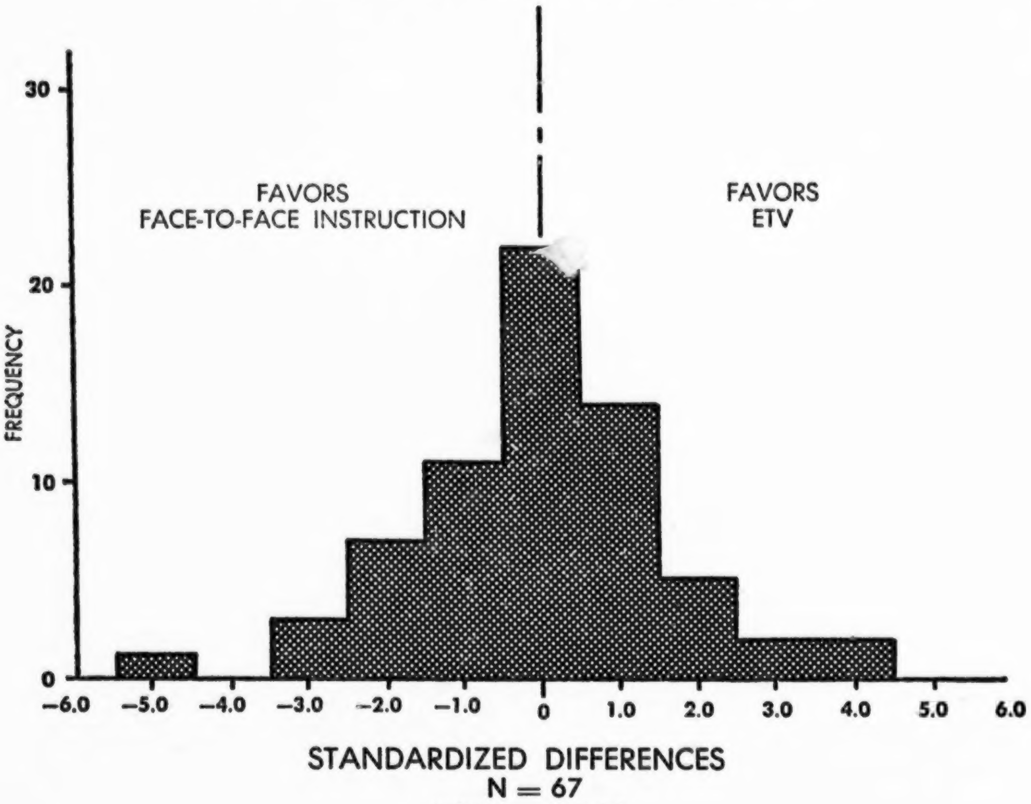
FIGURE 3

One-Way Television Is As Good As Face-to-Face Instruction
(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	62	39.2
Favors ETV	94	59.5
Shows No Difference	2	1.3
TOTAL	158	100.0

Studies: 91, 92, 93 94, 98, 99, 101, 104, 105, 106, 109, 111, 112, 113, 115, 117, 118, 120, 124, 126, 127, 128, 129, 130, 135, 136, 138, 140, 142, 144, 145, 146, 147, 148, 150, 156, 160, 163, 166, 167.



N = 67
MEAN = −0.03
SD = 1.59
t = 0.16 P > .50

Studies: 98, 99, 105, 111, 113, 115, 117, 118, 120, 124, 126, 127, 130, 140, 142, 147, 160, 163, 166, 167.

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* A grand total of 307 independent and non-independent comparisons were found for which 46.6% favor face-to-face instruction, 52.1% favor ETV and 1.3% show no difference.

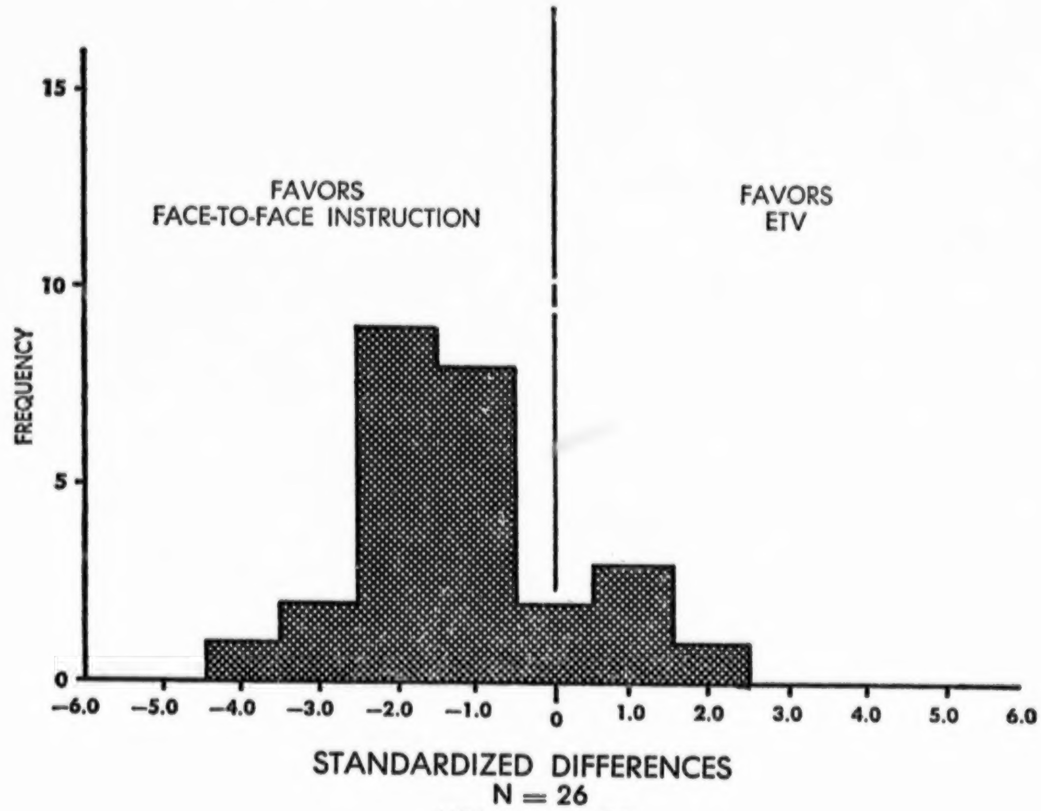
FIGURE 4

Face-to-Face Instruction Is Significantly Superior to Two-Way Television
(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	27	77.1
Favors ETV	8	22.9
Shows No Difference	0	0.0
TOTAL	35	100.0

Studies: 93, 102, 132, 163.



N = 26
MEAN = −1.25
SD = 1.39
t = 4.50 .001 > P

Studies: 102, 163.

---

* A grand total of 41 independent and non-independent comparisons were found for which 75.6% favor face-to-face instruction and 24.4% favor ETV.

FIGURE 5

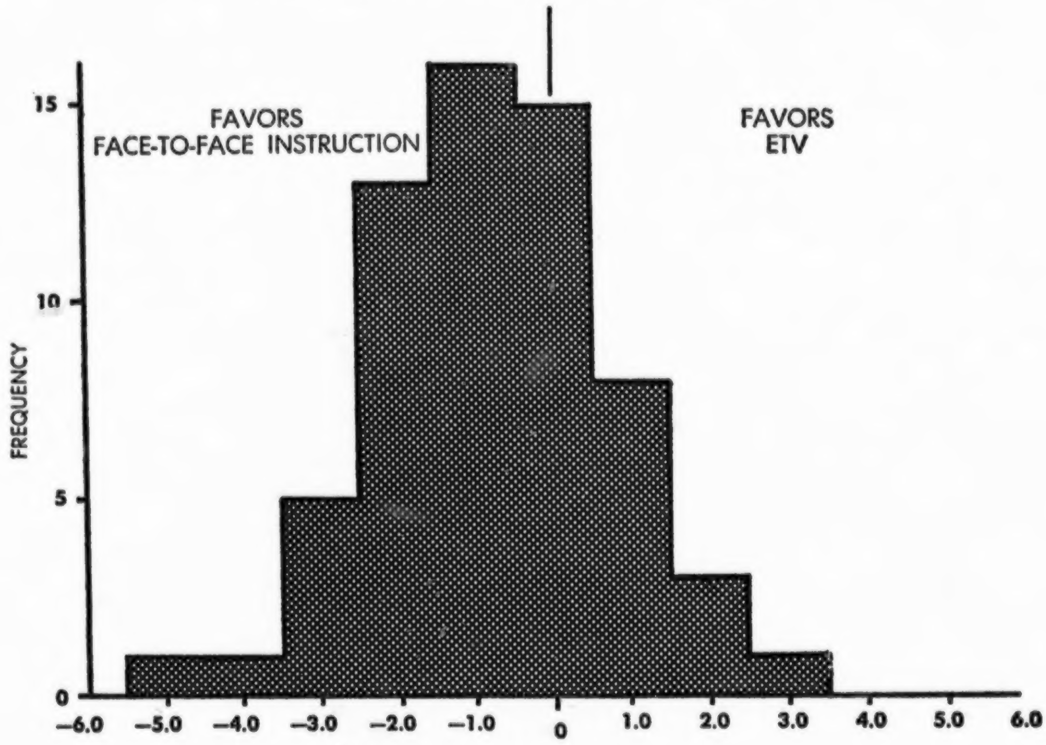
Face-to-Face Instruction Seems Superior to ETV When Lecture Is Employed

(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	71	55.9
Favors ETV	54	42.5
Shows No Difference	2	1.6
TOTAL	127	100.0

Studies: 91, 98, 101, 102, 104, 105, 106, 109, 111, 112, 115, 118, 120, 128, 130, 132, 135, 136, 140, 144, 145, 146, 147, 148, 150, 156, 160, 163, 166, 167.



STANDARDIZED DIFFERENCES
N = 63
MEAN = −0.82
SD = 1.50
t = 4.29   .001 > P

Studies: 98, 102, 105, 111, 112, 115, 118, 120, 130, 140, 147, 160, 163, 166, 167.

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* A grand total of 242 independent and non-independent comparisons were found for which 52.9% favor face-to-face instruction, 45.5% favor ETV and 1.6% show no difference.

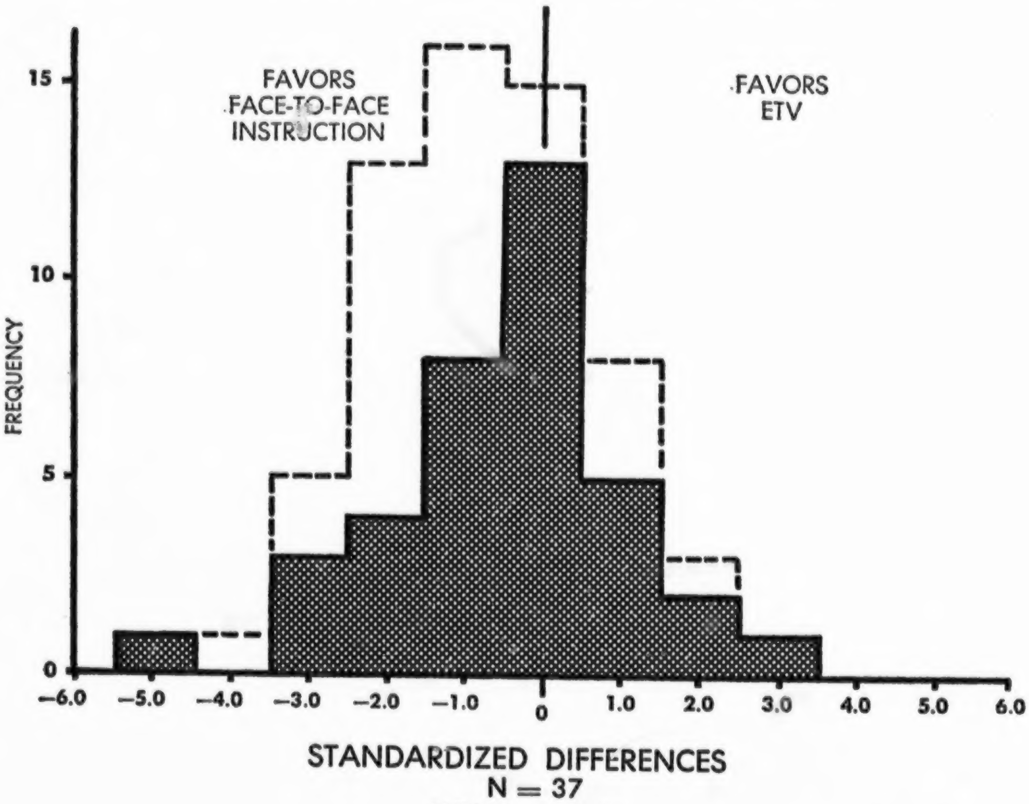
FIGURE 6

There Are No Differences Between Lecturing Face-to-Face and by One-Way TV
(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	46	47.9
Favors ETV	48	50.0
Shows No Difference	2	2.1
TOTAL	96	100.0

Studies: 91, 98, 101, 104, 105, 106, 109, 111, 112, 115, 118, 120, 128, 130, 132, 135, 136, 140, 144, 145, 146, 147, 148, 150, 156, 160, 163, 166, 167.



$N = 37$
$MEAN = -0.51$
$SD = 2.29$
$t = 1.33 \quad .10 > P > .05$

Studies: 98, 105, 111, 112, 115, 118, 120, 130, 140, 147, 160, 163, 166, 167.

---

* A grand total of 210 independent and non-independent comparisons were found for which 49.1% favor face-to-face instruction, 49.0% favor ETV, and 1.9% show no difference.

FIGURE 7

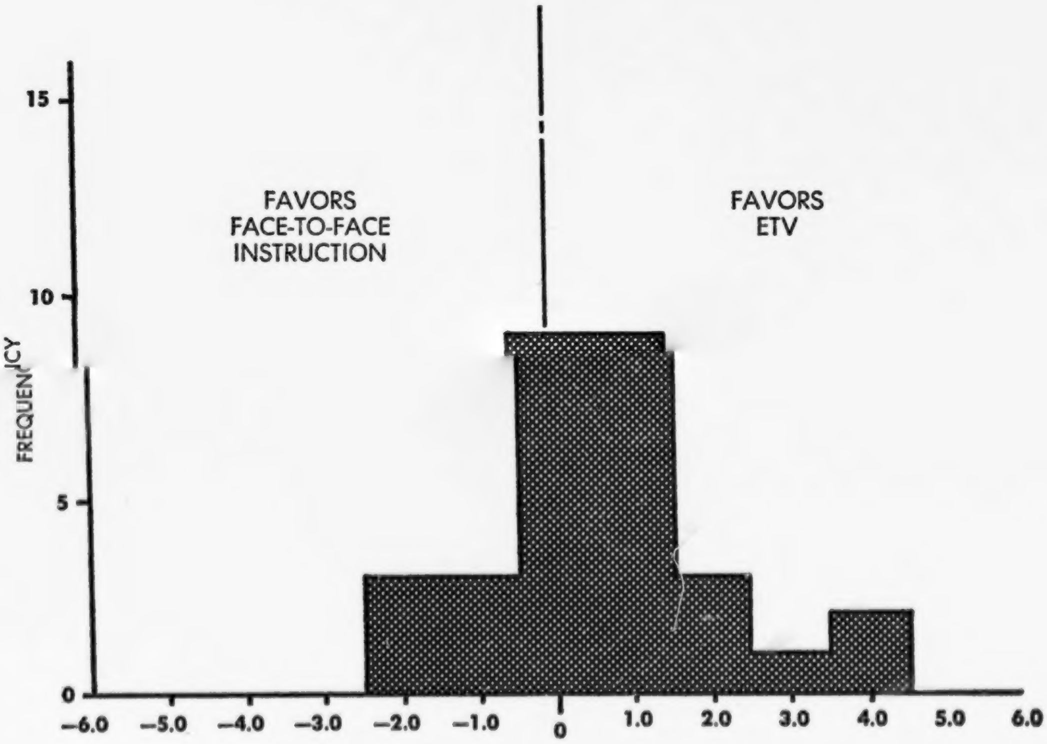
When Lecture and Discussion Methods Are Combined There Is No Media Difference

(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	17	28.3
Favors ETV	43	71.7
Shows No Difference	0	0.0
TOTAL	60	100.0

Studies: 92, 94, 99, 101, 113, 117, 118, 124, 126, 127, 129, 130, 138, 142.



STANDARDIZED DIFFERENCES
N = 30
MEAN = 0.56
SD = 1.52
t = 1.98 .10 > P > .05

Studies: 99, 113, 117, 118, 124, 126, 127, 142.

* A grand total of 92 independent and non-independent comparisons were found for which 42.4% favor face-to-face instruction and 57.6% favor ETV.

FIGURE 8

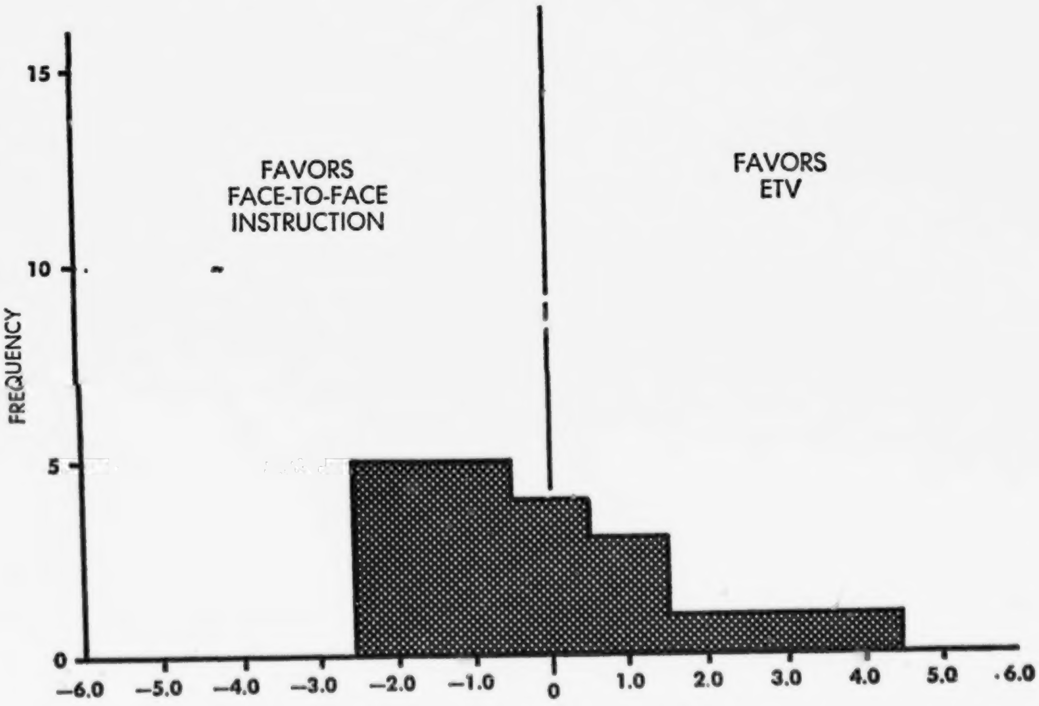
There Are No Media Differences in Teaching the Humanities

(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	23	36.5
Favors ETV	40	63.5
Shows No Difference	0	0.0
TOTAL	63	100.0

Studies: 94, 99, 101, 102, 111, 113, 117, 126, 138, 142, 145, 146, 147, 163, 166, 167.



STANDARDIZED DIFFERENCES
N = 20
MEAN = −0.12
SD = 1.75
t = 0.30 P > .50

Studies: 99, 102, 111, 113, 117, 126, 142, 163, 166, 167.

* A grand total of 114 independent and non-independent comparisons were found for which 46.5% favor face-to-face instruction and 53.5% favor ETV.

FIGURE 9

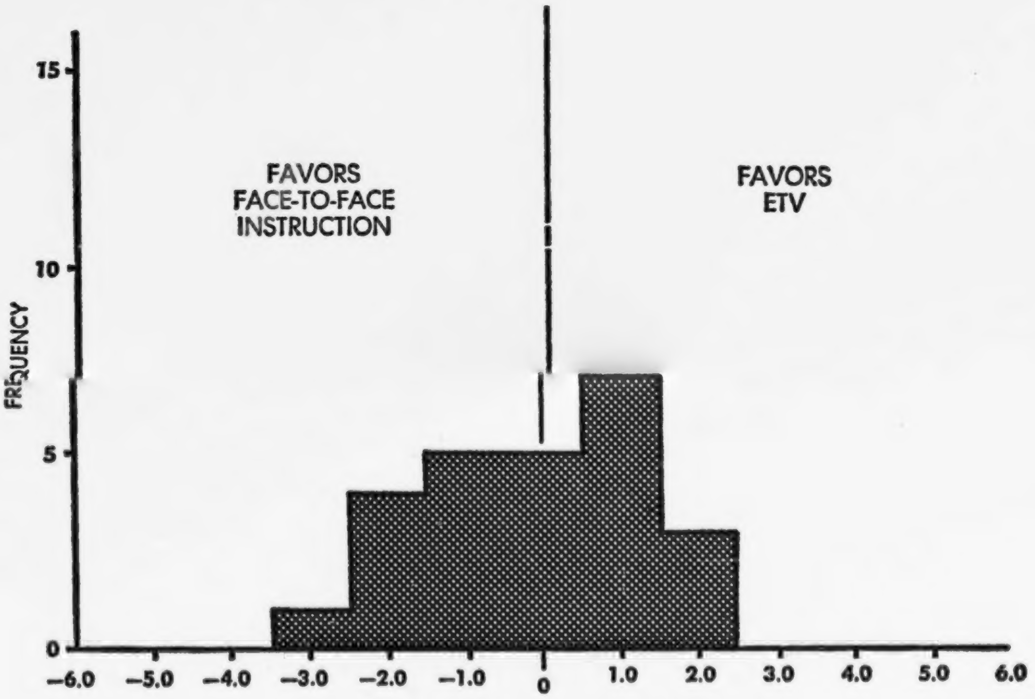
Social Science Instruction Is Equally Effective Face-to-Face or by ETV

(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	19	38.8
Favors ETV	29	59.2
Shows No Difference	1	2.0
TOTAL	49	100.0

Studies: 93, 99, 102, 115, 117, 118, 130, 132, 136, 140, 144, 145, 146, 147, 148, 163.



STANDARDIZED DIFFERENCES
N = 25
MEAN = −0.20
SD = 1.44
t = 0.67 $P > .50$

Studies: 99, 102, 117, 118, 130, 140, 147.

---

* A grand total of 85 independent and non-independent comparisons were found for which 52.9% favor face-to-face instruction, 45.9% favor ETV and 1.2% show no difference.

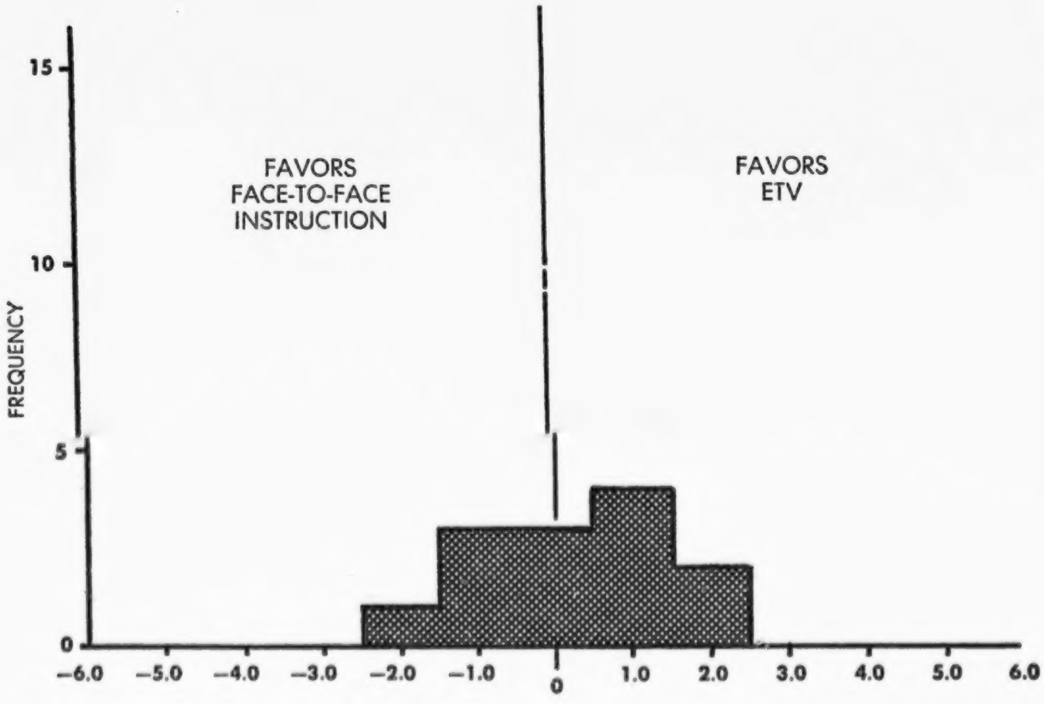
FIGURE 10

The Two Media Are Equally Effective in Teaching Psychology
(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	7	31.8
Favors ETV	15	68.2
Shows No Difference	0	0.0
TOTAL	22	100.0

Studies: 99, 115, 117, 118, 130, 136, 140, 146, 147, 148, 163.



STANDARDIZED DIFFERENCES
N = 13
MEAN = 0.16
SD = 1.30
t = 0.42 P > .50

Studies: 99, 117, 118, 130, 140.

* A grand total of 40 independent and non-independent comparisons were found for which 50.0% favor face-to-face instruction and 50.0% favor ETV.

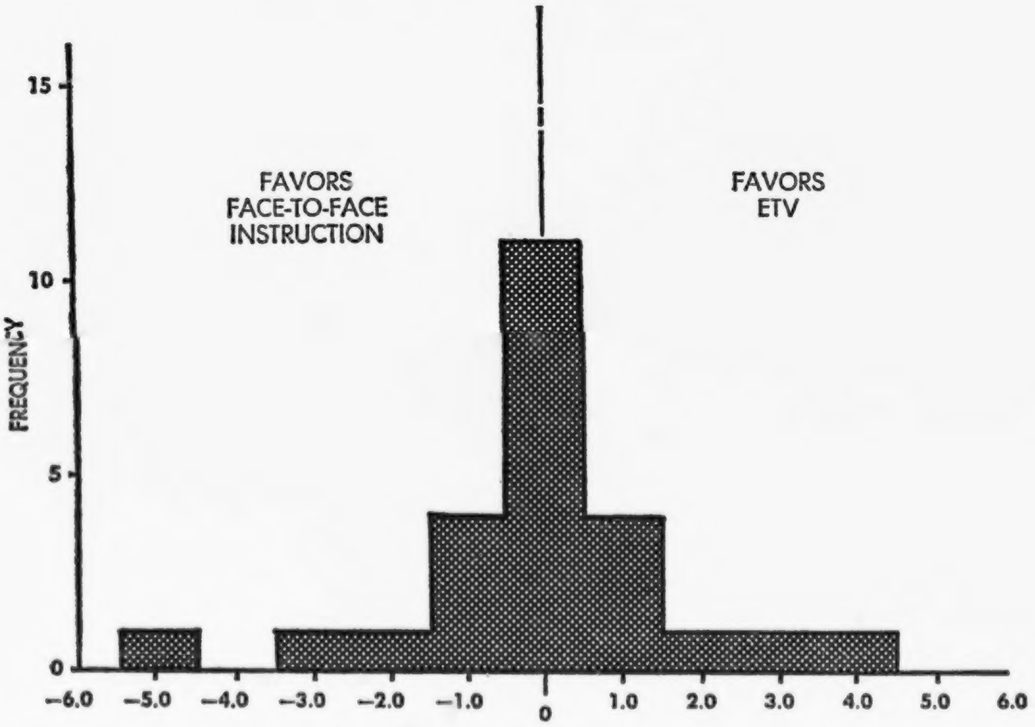
FIGURE 11

Math and Science Are Equally Well Taught
Face-to-Face or by ETV
(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	27	52.9
Favors ETV	23	45.1
Shows No Difference	1	2.0
TOTAL	51	100.0

Studies: 91, 101, 102, 104, 105, 106, 109, 112, 117, 118, 120, 124, 127, 128, 130, 135, 140, 145, 147, 150, 156, 160, 163.



STANDARDIZED DIFFERENCES
N = 25
MEAN = −0.16
SD = 1.77
t = 0.43 P > .50

Studies: 102, 105, 112, 117, 118, 120, 124, 127, 140, 160, 163.

* A grand total of 106 independent and non-independent comparisons were found for which 47.2% favor face-to-face instruction, 50.9% favor ETV and 1.9% show no difference.

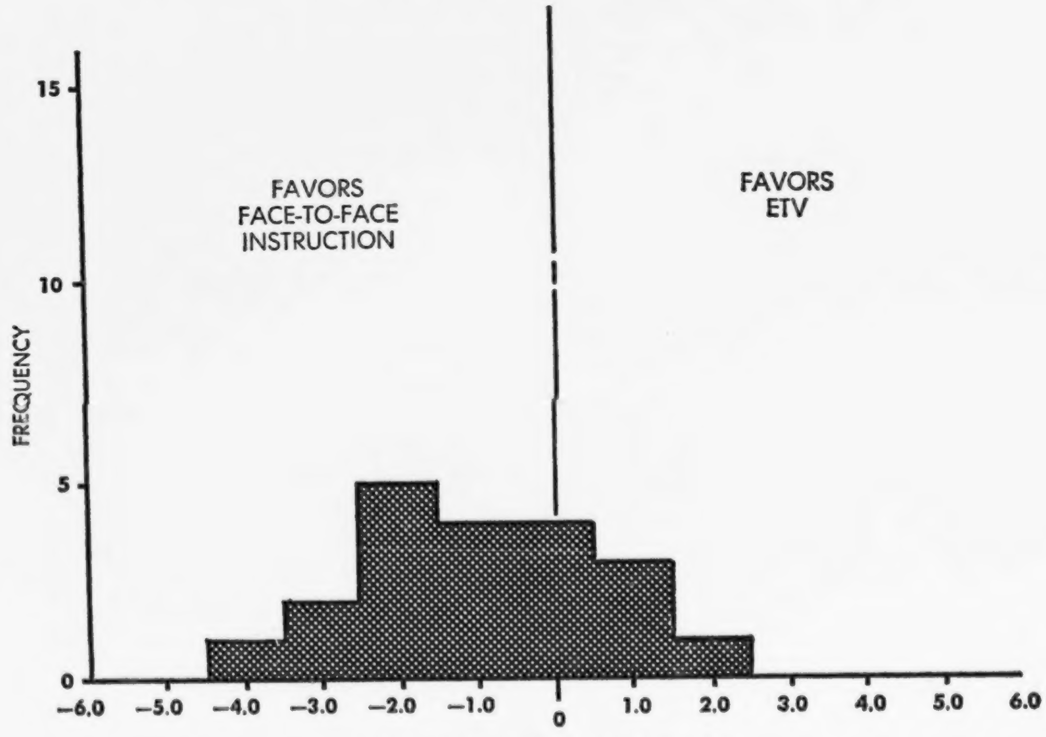
FIGURE 12

Health Seems More Ably Presented Face-to-Face Than by ETV
(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	15	65.2
Favors ETV	8	34.8
Shows No Difference	0	0.0
TOTAL	23	100.0

Studies: 98, 102, 115, 129.



STANDARDIZED DIFFERENCES
N = 20
MEAN = −0.92
SD = 1.55
$t = 2.60$ $.02 > P > .01$

Studies: 98, 102, 115.

* A grand total of 28 independent and non-independent comparisons were found for which 64.3% favor face-to-face instruction and 35.7% favor ETV.

FIGURE 13

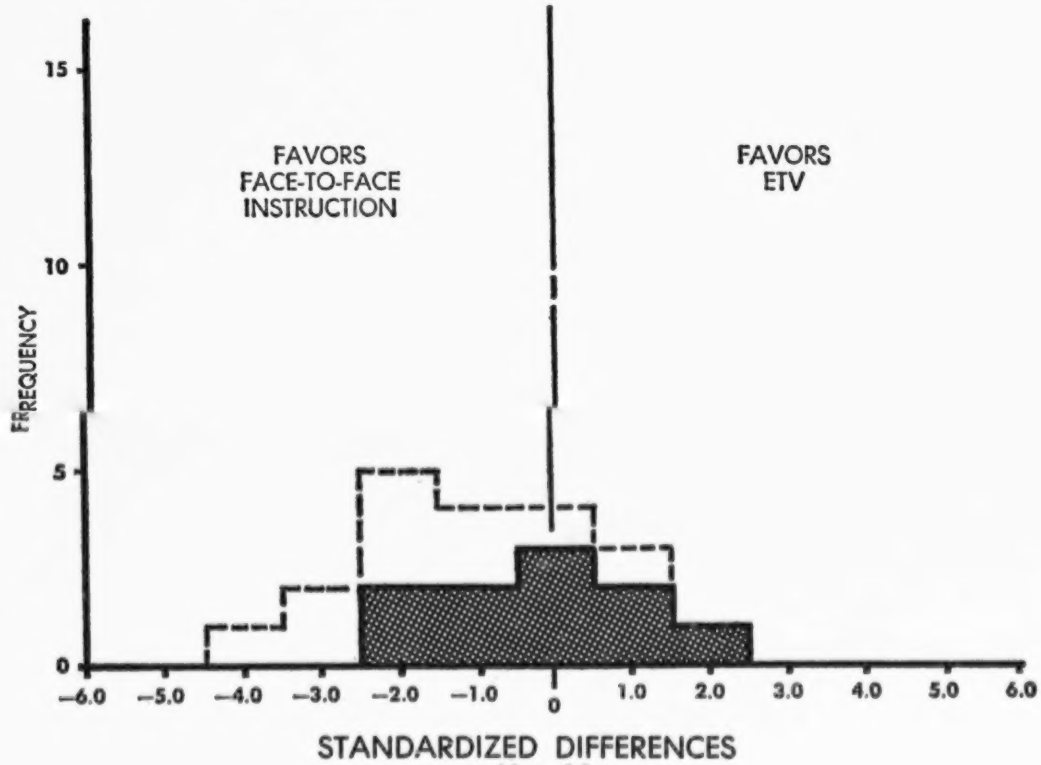
There Are No Differences Between Teaching Health Face-to-Face and by One-Way TV

(Independent Comparisons)

SIGNED DIFFERENCES*

THE DIFFERENCE	N	%
Favors Face-to-Face Instruction	5	41.7
Favors ETV	7	58.3
Shows No Difference	0	0.0
TOTAL	12	100.0

Studies: 98, 115, 129.



N = 10
MEAN = −0.10
SD = 1.27
t = 0.23 P > .50

Studies: 98, 115.

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* A grand total of 17 independent and non-independent comparisons were found for which 47.1% favor face-to-face instruction and 52.9% favor ETV.

CHAPTER
2

Professors' Views on ETV

The principal direct users of educational television are professors. Consequently, their attitudes toward ETV will probably play a significant role in the rate of adoption of ETV at the college level. In this chapter we examine the professors' orientations as revealed in a number of different studies ranging in time, place, and in purpose. We are seeking the underlying structure of attitudes, and the shifts that may occur in them through time.

Our analytical problem is to determine the structure of attitudes of primary or potential users of a major technological innovation. In our analysis we give particular attention to the dynamics of shifts in attitudes among the favorable, unfavorable, and neutral categories. Of special interest is the fact that much of the attitude shift is into and out of the neutral category. The existence of a significant number of faculty members with neutral orientations toward ETV is an important bit of information in selecting strategies for its adoption, and increasing utilization.

Personal Impact Reduces Acceptance

The closer the introduction of educational TV comes to the daily behavior and personal life of the professor, the less positive his attitudes are likely to be toward ETV. This generalization may be demonstrated by examining the responses of professors to questions about ETV. When the more abstract questions are asked, like: "What is your feeling about television instruction generally?" the responses are largely favorable with one-third or less responding in the unfavorable direction. On the other hand, when asked whether they would send their children to a university using ETV in large elementary courses, or one which did not, a much higher proportion have unfavorable attitudes toward ETV. Obviously this question is personally more salient than the first.

There seems to be operative a threat factor with regard to faculty attitudes. The closer the individual member of the faculty comes to being directly involved with ETV, the more he may feel threatened by the innovation, and the more he is likely to adopt a neutral or negative stance toward it.

An obvious administrative implication of this attitude shift is that dependence should be placed upon utilizing professors who are initially favorably inclined to produce and sustain ETV in the college classroom and not upon those who have neutral or unfavorable attitudes toward undertaking this form of instruction. Put another way, those members of the teaching staff who are willing should be given the opportunity to adopt the innovation and those who do not consider it a desirable innovation should not be forced to subscribe to its usage.

THE DIM AND DISTANT VIEW

Professors approve of ETV in a general and diffuse way. Non-specific faculty attitudes toward ETV are summarized in TABLE 1. Although there is a wide range in the proportion responding favorably to a general question about ETV from one academic institution to the next, there is only one case (a small, denominational school) in which negative attitudes actually exceed favorable ones. Except for this one case, unfavorable attitudes tend to remain relatively constant, rarely exceeding one-third of the entire sample. The neutral attitudes tend to vary with degree of favorability. There is a general increase in neutrality toward ETV as favorability declines; in those colleges and universities where approval of ETV is limited, professors tend to be neutral rather than unfavorable. Except for a hard core of faculty generally unfavorable to ETV (around 15-20 percent) professors' attitudes are either favorable or neutral.

The results of the second Oregon Study indicated a decline in the proportion reporting favorable attitudes toward ETV over the five-year period represented. However, it will be noted that this was not accom-

Table 1

PROFESSORS ARE MORE FAVORABLE THAN UNFAVORABLE TOWARD ETV

QUESTION: *What is your feeling about television instruction generally?**

				ATTITUDE TOWARD ETV		
Source-Study No.	Year of Study	Academic Institution	N	Favorable	Neutral	Unfavorable
28 (p. 49)	1959	Ore. Col. Ed.	28	75%	11%	14%
		Ore. St. U.**	171	62	18	20
		U. of Ore.	123	58	21	21
		Willamette U.	26	42	15	43
29 (p. 32)	1961	U. of Minnesota	892	47	42	11
13 (Appendix., Table 3)	1962	U. of Houston	117	46	19	35
01 (p. 23)	1965	Ore. Col. Ed.	32	50	22	28
		Ore. St. U.	42	27	50	23
		U. of Ore.	39	38	34	28
		Port. St. Col.	17	48	28	24

* Because we are comparing faculty attitudes on questions having a somewhat different phrasing from study to study, we have combined the responses of the several studies as follows: Favorable (including any degree of favorableness); Unfavorable (including any degree of unfavorableness); and Neutral (including Indifferent, Undecided, Don't Know, and no response).

** Oregon State College became Oregon State University in 1961.

(NOTE: The full citation to source is identified by study number in the **Bibliography** related to the special subject of this and each succeeding table.)

panied by a corresponding increase in the proportion reporting unfavorable attitudes. Obviously, over the five-year period during which the State System of Higher Education in Oregon experimented with interinstitutional ETV (IITV) among the colleges and universities in which the attitudes were measured, there was a substantial shift from favorable to neutral attitudes toward television instruction. When an innovation has been around for awhile it may generate indifference or neutrality after those who want to use it have, and those who have not adopted it feel no pressure to do so.

In TABLE 2 professors' general attitudes toward televised instruction are categorized by academic areas of faculty. The picture here is similar to TABLE 1 except the predominantly favorable responses are grouped within a tighter range (40%). Here again the neutral and uncommitted responses are most interesting in that they sometimes account for as much as 60% of the individual faculty samples, and generally, although there are some notable exceptions, it is neutrality rather than unfavorability that increases as favorability declines.

Table 2

SOME ACADEMIC AREAS ARE MORE FAVORABLE THAN OTHERS TOWARD ETV

QUESTION: *What is your feeling about television instruction generally?**

Source-Study No.	Year of Study	Academic Specialism	N	ATTITUDE TOWARD ETV Favorable	Neutral	Unfavorable
29 (p. 22) U. of Minnesota	1961	Veterinary Medicine	29	69%	28%	3%
		Education	121	69	29	2
		Medical Science	165	64	31	5
		General College	39	49	38	13
		Agriculture, Forestry & Home Econ.	130	46	49	5
		Science, Lit., & the Arts	218	35	43	22
		Business	25	32	60	8
		Institute of Technology	133	30	52	18
01 (p. 23) Oregon Study	1965	Education	14	64	36	0
		Physical Education	12	41	43	16
		Humanities, Sci., & Soc. Science	93	34	38	28
		Business	11	36	10	54

* See notes, Table 1.

Two possible and somewhat complementary explanations are presented for the relative order of the various faculties' approval of ETV. First, although the data are inadequate on this point, one could hypothesize that faculty acceptance of ETV will be greater in those fields which rely heavily on visual techniques and demonstrations as an intrinsic part of the teaching process. Although we will examine this point in greater detail later, several studies of professors' attitudes toward ETV suggest that the medium is used to advantage in those areas:

> . . . which are best suited to the use of demonstrations, visuals and panels, and would lend themselves well to televised presentation. Courses which require a good deal of teacher-pupil interaction (e.g. some courses in fine arts) and courses which do not lend themselves to frequent changes in pace would not seem to be amenable to televised presentation.[1]

Consequently, professors of education and members of those science faculties which utilize demonstrations and visual aids as an integral part of the teaching method are more favorable to the use of ETV as an educational tool.

Closely allied to the above, and forming the second explanation for the relative order in which disciplines favor ETV, the data in both studies would seem to suggest a possible ideological influence in the degree of acceptance. Particularly among members of those faculties in which there is limited acceptance (e.g. the arts, humanities and business), there may exist a credo emphasizing the necessity for a high degree of teacher-pupil interaction. The following comment, made after six English instructors had just completd teaching via television, provides some understanding of the varying degree of favorability toward ETV evidenced in TABLE 2.

> I was loath to question students about television; I was sure I'd get negative reactions. . . . English Composition and English Literature don't lend themselves to television. . . . the basic problem of College Composition is that students need *individual* instruction. . . . Student morale is lower in the television section than in the conventional section.[2]

Because these are only isolated comments, they are included more for the mood they convey rather than to provide the documentation that will be necessary to test explanations of differential acceptance of ETV among disciplines.

ETV AND US

TABLE 3 provides additional data supporting the contention that as the prospect of actually becoming personally involved with ETV draws closer, professors view it less favorably. Here professors were asked: "What do you think about having courses in your area of specialization televised from this institution to students at other participating institutions? (Assume that you are not personally teaching on TV.)"[3]

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[1] Response by a television instructor quoted in F. G. Macomber and L. Siegel, *Final Report of the Experimental Study in Instructional Procedures* (Oxford, Ohio: Miami U., January 1960), p. 50. See also G. Starlin and J. E. Lallas, *Inter-Institutional Teaching by TV in the Oregon State System of Higher Education: Report No. 1—1957-1959* (Eugene, Oregon: Oregon State System of Higher Education, March 1960), pp, 55 ff; J. E. Stecklein and L. A. Olson, "Faculty Attitudes Toward the Use of CCTV in University Instruction" (Minneapolis: Bureau of Institutional Research, U. of Minnesota, December 1961), p. 23; and R. B. Hull, "Greater Columbus Area ETV Project: Final Report—1959-1962" (Columbus, Ohio: Ohio State U. Research Foundation, November 1962), pp. 34-35.

[2] Quoted in H. L. Klapper, *CCTV as a Medium of Instruction at New York University—1956-1957* (New York: New York U., 1958), p. 25.

Table 3

FACULTY STILL FAVOR DOING ETV AND EXPORTING IT

QUESTION: *What do you think about having courses in your area of specialization televised from this institution to students at other participating institutions? [Assume that you are not personally teaching on TV.]**

			ATTITUDE REGARDING ORIGINATING TV COURSES		
Academic Institution	Year of Study	N	Favorable	Neutral	Unfavorable
Oregon College of Education	1957	40	58%	37%	5%
	1959	28	43	36	21
University of Oregon	1957	208	46	28	26
	1959	123	38	36	26
Willamette University	1957	50	40	22	38
	1959	26	35	23	42
Oregon State College	1957	256	37	36	27
	1959	171	34	38	28

Source: 28, p. 51.
* See notes, Table 1.

A comparison of the 1959 figures of the Oregon study in TABLES 1 and 3 reveals that the favorable response rate drops as much as 32% Although response does become slightly more unfavorable, it is the neutral category that registers the biggest increase (up to 25%). Again we may conclude, that as favorability toward ETV declines, neutrality toward it increases.

ETV AND ME

We note significant changes in reaction to ETV when the question involves direct, personal participation in it. TABLE 4 presents professors' responses to the question of whether they would like to experiment personally by teaching one or more of their courses on CCTV. Comparing the 1959 Oregon figures from TABLES 1, 3 and 4, favorable responses consistently drop (as much as 50% from TABLE 1 to TABLE 4), unfavorable attitudes do not in all cases remain constant as previously noted, (there is an increase of almost 20% in one case), while neutrality in two cases remains the same. Hence, we observe in TABLE 4 a shift in the relationship beginning to occur. As favorability declines, rather than increasing neutrality, a polarization of attitudes forms, with the neutral category becoming increasingly smaller. A comparison of the University of Minnesota figures for TABLE 1 and TABLE 4 confirms this point.

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[3] Starlin and Lallas, *op. cit.*, pp. 50-51.

Table 4

THE PERSONAL USE OF ETV IS VIEWED WITH SOME HESITANCY

QUESTION: *How would you like to try out closed-circuit television in one or more of your classes?**

Source-Study No.	Year of Study	Academic Institution	N	ATTITUDE TOWARD PERSONALLY EXPERIMENTING WITH ETV Favorable	Neutral	Unfavorable
32	1955-56	Pennsylvania State U.	177	43%	30%	27%
	1956-57		140	45	24	31
	1957-58		143	33	28	39
	1958-59		136	39	12	49
31 (pp. 340-1)	1957	State U. of Iowa	160	51	10	39
28 (p. 50)	1957	Oregon College of Ed.	40	42	43	15
	1959		28	25	36	39
	1957	Oregon State College	256	28	51	21
	1959		171	23	47	30
	1957	U. of Oregon	208	24	40	36
	1959		123	26	38	36
	1957	Willamette U.	50	26	26	48
	1959		26	15	43	42
29 (p. 32)	1961	U. of Minnesota	892	36	34	30

* See notes, Table 1.

At the point where professors not only face the prospect of becoming personally involved but actually become committed, either hypothetically or in practice, polarization of attitudes occurs. This is displayed quite dramatically in the Pennsylvania State figures. In the 1955-56 sample, 30% fall into the neutral category, while in 1958-59, only 12% are so oriented.

Table 5

TEACHING BY TV REGULARLY GENERATES MORE UNFAVORABLE AND LESS NEUTRAL ATTITUDES

QUESTION: *What is your reaction to regularly teaching a TV course?**

Source-Study No.	Year of Study	Academic Institution	N	ATTITUDE TOWARD REGULARLY TEACHING VIA ETV		
				Favorable	Neutral	Unfavorable
32	1955-56	Pennsylvania State U.	177	40%	13%	47%
	1956-57		140	41	15	44
	1957-58		143	29	13	58
	1958-59		136	29	8	63
22 (p. 53)	1960	Miami University	94	30	25	45
21 (p. 37)	1960	U. of North Carolina	365	32	35	33
	1961		174	31	38	31

* See notes, Table 1.

In TABLE 5 professors' attitudes toward *regularly* teaching one or more CCTV courses are summarized. This more extreme measure of potential personal involvement and present commitment serves to diminish the neutral category even further. It is also noted that whereas the unfavorable responses are significantly increased, favorable responses remain relatively constant, with little change from TABLE 4 to TABLE 5. This would seem to suggest that similar to the hard core of professors unfavorable even to the general prospect of ETV (15-20%), there is a comparable faculty group enthusiastic about the advent of ETV (about 33%), even to the point of asserting they might regularly employ television instruction methods.

The same kinds of response are found in TABLE 6 as in the preceding ones. Tabulated in TABLE 6 are responses to the following statement: "If two universities were alike, except that one televised its large elementary courses and the other did not use television, it would be preferable to send a son or daughter to the university using television."[4]

Table 6

ETV IS NOT FOR MY OWN CHILDREN UNLESS I'M A TV TEACHER

QUESTION: *If two universities were alike, except that one televised its large elementary courses and the other did not use television, would it be preferable to send a son or daughter to the university using television?*

Source-Study No.	Year of Study	CCTV Teaching Experience	N	ATTITUDE TOWARD ENROLLING CHILDREN IN A TV UNIVERSITY*	
				Favorable or No Difference	Unfavorable
32 Pennsylvania State U.	1955-56	Non-TV Teachers	177	37%	59%
	1956-57	"	140	36	62
	1957-58	"	143	19	75
	1958-59	"	136	21	75
	1956-57	TV Teachers	15	77	15
	1958-59	"	16	87	13
29 (p. 10) U. of Minnesota	1961	All Faculty	892	35	46

* The difference between the sum of Favorable and Unfavorable and 100% includes No Opinion and no response.

It seems probable that what happens to one's children may be as close a personal impact as may be felt. For professors, the greatest proportion of negative responses toward ETV is generated by threatening exposure of their own children to it. For example, the non-TV teachers, year by year at Pennsylvania State University, are more unfavorable in responding to this prospect than any others associated with ETV. This is also true for the entire faculty at the University of Minnesota.

Following the flow of attitudes as we move from most remote to most personal impact of ETV on the professors who are its potential users, a clear generalization emerges. The more personal is the probable impact of this innovation, the more unfavorable is the potential user's attitude toward it.

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[4] Stecklein and Olson, *op. cit.*, p. 10.

USERS ARE FAVORABLE

It should be noted at this juncture, however, that we are, for the most part, analyzing professors' attitudes *before* they actually become personally involved with the teaching of CCTV courses. We cannot assume that the same one-third will be favorable, the same 15-20% will be unfavorable, and the remaining half will remain more or less neutral or uncommitted *after* they actually become involved.[5] Obviously not all professors will become TV teachers. It therefore depends largely on what basis TV teachers are selected and the condition surrounding the introduction of instructional television within the univesity setting as to what proportion of professors will continue to remain favorable, unfavorable, or neutral toward the prospect of ETV. An examination of the reasons for the favorable response recorded by TV teachers at Pennsylvania State would suggest that the conditions and method of selection there are instrumental to the establishment of televised instruction within the educational institution.

TABLE 7 summarizes professors' general attitudes toward ETV based on whether or not they have personally used instructional television. Here a very real difference is seen in the degree of favorability registered toward ETV. Depending upon the method of selection of TV teachers (self-selection or administrative decree), it seems reasonable to assume

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[5] Stanley D. Handleman, "A Comparative Study of Teacher Attitudes toward Teaching by CCTV" (New York: dissertation, New York U. 1960), p. 107, makes the following relevant statement regarding his empirical investigations: "Of particular importance is the confirmation of the observed opinion found in much of the literature that once teachers become involved in teaching by television, they become strong allies and that the positive attitudes of these teachers grow stronger as they continue to teach by television." See also, R. E. Dreher and W. H. Beatty, *An Experimental Study of College Instruction Using Broadcast Television—Project Number One* (San Francisco: San Francisco State College, 1958), pp. 51-52, where they state: "The varied experiences of the professors in this study suggest strongly that the extent to which one's departmental and divisional colleagues are *involved* in both the planning and execution of a [TV] course, the more positive or acceptable faculty comments become." See also, Clifford G. Erickson and H. M. Chausow, "Chicago's TV College: Final Report of a Three Year Experiment of the Chicago City Junior College—Offering College Courses for Credit via Open Circuit Television" (Chicago: Chicago City Junior College, August 1960), p. 18, where the authors state: "As the number of TV teachers increased with each succeeding semester, faculty attitudes towards TV College become more favorable." For additional confirmation of this point, see "An Evaluation of CCITV in Los Angeles Junior Colleges—Report No. 2" (Los Angeles: Los Angeles City School Districts, Division of Extension and Higher Education, 1958), p. 51.

Table 7

IF ETV IS USED, IT IS LIKED*

Academic Institution	Year of Study	ETV Teaching Experience	N	ATTITUDE TOWARD ETV Favorable	ATTITUDE TOWARD ETV Unfavorable
U. of Minnesota	1961	No Previous Experience	809	45%	12%
		Previous Experience	76	70	7

Source: 29, p. 33.

* The difference in the sum of the Favorable and Unfavorable categories and 100% is represented by Neutral, Indifferent, Undecided, Don't Know, and no response.

that those professors actually using instructional television will be more favorable toward it than those who are not using it.

TABLE 8 contrasts the attitudes of professors who have *observed* ETV with those who have taught ETV courses. Faculty members were asked to compare ETV classes with regular classroom instruction. Once again, with different data, the contrasts between the television and traditional professors are striking. Not only do TV professors' favorable attitudes exceed those of professors with no television experience upwards of 25%, but also their unfavorable attitudes are minimal compared with traditional professors' negative evaluations.

Table 8

IF ETV IS TAUGHT IT IS LIKED MUCH MORE THAN IF JUST OBSERVED

Academic Institution	Year of Study	ETV Teaching Experience	N	COMPARISON OF ETV TO REGULAR CLASSES Better or Same	COMPARISON OF ETV TO REGULAR CLASSES Worse
Pennsylvania State U.	1955-56	Observed but No Previous Experience	48	43%*	52%
	1956-57		55	60	38
	1957-58		82	45	45
	1958-59		87	51	43
	1956-57	Previous Experience	10	84	8
	1958-59		16	86	7

Source: 32

* Residual response category—no answer.

GENERALLY FAVORABLE ARE PERSONALLY FAVORABLE

TABLE 9 provides empirical support for what we have proposed throughout this section, i.e., there is a relationship between professors' general attitudes toward ETV and their attitudes toward personally teaching CCTV courses. We have shown that as the probability of ETV use becomes more personally involving, initial favorability declines, neutrality increases, and unfavorableness remains relatively constant. At the point of personal commitment, whether real or hypothetical, polarization of attitudes begins to occur, thus decreasing neutrality. Increasing the measure of personal involvement and commitment serves to isolate a hard core of "enthusiasts" and relegate the neutral response category to obscurity. A careful examination of TABLE 9, together with the preceding discussion, reveals this course of development.

Table 9

LIKING ETV, AND LIKING TO USE IT GO TOGETHER

Attitude Toward Personal Use of ETV	ATTITUDE TOWARD THE USE OF ETV IN UNIVERSITY INSTRUCTION		
	Favorable	Neutral[b]	Unfavorable
Would like it	57%	20%	7%
Would be indifferent[a]	32	44	9
Would dislike it	11	36	84
Totals	100% (423)	100% (368)	100% (101)

Adapted from: 29, p. 38, U. of Minnesota, 1961.

[a] Includes no response and those responding Indifferent and Undecided in survey.

[b] Includes no response and those responding Neutral and Undecided in survey.

Who Are Likely Candidates for TV Professor?

If an educational policy committee or college administrator wished to find the most receptive segment of the college into which to introduce ETV, to which schools or departments would they turn? The best answer to this question should be found by examining the past history of successful recruitment of TV professors. Unfortunately, the data here are most inadequate. Few studies describe how TV professors were selected. However, an inspection of the data does reveal professors' attitudes toward trying out ETV, according to their academic specialism, academic rank, and size of largest class ever taught. Based on these distinctions, we can offer a likely basis for the selection of TV professors.

TABLE 10 shows professors' attitudes in one large university toward trying out ETV, reported by academic specialism. Using the total university average as a dividing line, we can state that in those schools or colleges in which favorable proportions of staff exceed unfavorable by 2 to 1, the orientations among professors suggests the probability of their being willing to commit themselves to using instructional television. Obviously, as a basis for selection of TV professors, this would be inadequate to most university administrators seeking to introduce television into all academic disciplines. However, selection from those disciplines displaying a two-to-one balance in favor of ETV could certainly serve as the first step toward university-wide application.

Table 10

CHANCES OF ADOPTING ETV ARE HIGH WHEN FAVORABLE EXCEED UNFAVORABLE ATTITUDES BY 2 TO 1*

				ATTITUDE TOWARD TRYING OUT ETV	
Academic Institution	Year of Study	Academic Specialism	N	Favorable	Unfavor-able
U. of Minnesota	1961	Medical Sciences	165	54%	15%
		Education	121	51	14
		Veterinary Medicine	29	45	10
		General College	39	41	23
		Total University	892	36	30
		Institute of Technology	133	32	37
		Science, Lit. & Arts	218	29	47
		Agric., Forestry & Home Econ.	130	22	27
		Business Administration	25	8	48

Source: 29, p. 23.
* See note, Table 7.

In TABLE 11, professors' attitudes toward trying out ETV are related to their academic rank. Once again, by using the total university figures, we can establish a dividing line. This crude measure reveals that the TV professor can be most successfully sought among those with the rank of

Table 11

THE LOWER THE RANK, THE MORE FAVORABLE THE ATTITUDES*

Academic Institution	Year of Study	Academic Rank	N	ATTITUDE TOWARD TRYING OUT ETV	
				Favorable	Unfavorable
U. of Minnesota	1961	Instructor	176	44%	20%
		All Ranks	892	36	30
		Assistant Professor	216	40	33
		Associate Professor	218	28	36
		Professor	282	34	28

Source: 29, p. 32.
* See note, Table 7.

university instructor. From the rank of instructor upward, favorability decreases while unfavorability increases. However, full professors are, on balance, more favorably disposed than associate and assistant professors. If this is a general relationship, it suggests another possible basis for TV teacher selection. Because full professors usually exercise considerable influence in faculty deliberations, an astute administrator would do well to seek out those professors who are favorable toward experimenting with ETV to secure their active participation as an example for reluctant colleagues.

TABLE 12 reveals yet another basis for selecting the TV teacher—the size of largest class ever taught. Professors were asked to respond to two questions simultaneously posed: What is your reaction toward teaching a TV course; A large class other than TV? The responses to both questions run generally in the same direction. We can conclude that the TV teacher can be more advantageously recruited within that group of professors teaching a large class (over 100 students). The fact that the professor who teaches a large class is more disposed to prefer teaching a large class, rather than a TV course, does not deny the additional fact that large-class professors are more favorable to teaching a TV class than small-class professors.[6]

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[6] Stecklein and Olson, *op. cit.*, p. 35, in addition to asking the above two simultaneous questions, posed "a forced choice between television or larger classes to handle enrollment increases." Their data reveal that "faculty now teaching large classes [more than 35 students] were clearly in favor of extending this method to

Table 12

BIG CLASS INSTRUCTORS ARE LEAST NEGATIVE ABOUT ETV*

Academic Institution	Year of Study	Size of Largest Class Ever Taught	N	ATTITUDE TOWARD TEACHING A			
				TV COURSE		LARGE CLASS	
				Favorable	Unfavorable	Favorable	Unfavorable
Miami U.	1960	Over 100 Students	27	34%	33%	71%	11%
		Total University	94	30	45	59	27
		51-100 Students	32	31	53	65	28
		Under 50 Students	35	26	46	43	37

Source: 22, p. 53.
* See note, Table 7.

THE TV INSTRUCTOR AS A PERSON

Two faculty attitude studies actually put the question to TV teachers and receiving-room instructors as to what constitutes the bases for the "identification and selection of ETV teachers."[7] TABLE 13 presents a list of the selection criteria mentioned in both studies, classified according to whether they involve personal characteristics, knowledge and ability, experience, or other considerations.

It will be noted that personal qualities and characteristics constitute almost half the criteria listed. The Los Angeles study offers a relevant explanation:

> It is interesting to note that most TV instructors consider their own wishes and attitude toward teaching by television of primary importance, and even more to be considered than probable excellence as a TV instructor or academic reputation. Placement of personal qualities high on the

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the solution of prospective enrollment problems (69.8 per cent vs. 17.5 per cent), whereas respondents teaching small classes [35 or fewer students] were more evenly divided between teaching larger classes and utilizing television as solutions (47.7 per cent vs. 41.5 per cent)." See also the discussion in "East Carolina College CCTV Experiment" (p. 49), where they find that "virtually all teachers who have tried television teaching feel that television classes are superior to other large group teaching procedures."

[7] See George Timmons and J. Fey, "Inter-Institutional Teaching by TV in the Oregon State System of Higher Education: Report No. 6—1961-62," (Faculty attitudes: TV Teachers' Reactions) (Eugene, Oregon: Oregon State System of Higher Education, 1964), p. 12; and, "An Evaluation of CCITV in Los Angeles Junior Colleges," pp. 59-60.

Table 13

CRITERIA FOR SELECTION OF ETV TEACHERS ARE DIVERSE*

	STUDY IN WHICH MENTIONED		
	Oregon	L.A.	Both
A. Personal Characteristics			
1. Personal wishes of instructor being considered		x	
2. Attitudes of instructor toward ETV		x	
3. Adaptability and versatility			x
4. Fluency of speech and poise before groups			x
5. Warmth and sincerity of personality			x
6. Dynamic and dedicated	x		
7. Ability to project one's self	x		
8. Interested in teaching	x		
9. Enjoy appearing before the public	x		
10. Telegenic appearance		x	
11. Willingness to teach with great energy	x		
12. A good performer	x		
B. Teaching Ability and Knowledge of Field			
1. Superior teacher			x
2. Thorough knowledge of the subject to be taught	x		
3. Ability to perceive student reactions	x		
4. Knowledge of the level of student understanding	x		
5. Ability to make the subject live	x		
6. Academic reputation, degrees earned, etc.		x	
C. Experience with Teaching and Television			
1. Knowledge of the limitations of the medium	x		
2. A wide experience in teaching	x		
3. Has observed others in action	x		
4. Participated in radio-television, panels, or discussions	x		
5. Number of times he has taught TV courses		x	
D. Other Considerations			
1. Recommendation of administrators and department chairman		x	
2. Leaving vacancy so other instructors may experience ETV		x	
3. Elapsed time since teaching last TV course		x	

* Adapted from: 34, p. 13; and 12, p. 60.

list is consistent with the finding . . . that instructional television is not an entity in itself, but, rather, a new and delicate means of communication, which intensifies—exaggerates, almost—whatever goes into it. If an instructor is naturally of a warm personality, over TV he will seem to be more so. If his lesson is well prepared, so that it moves quickly and logically along, TV will intensify students' impressions. If, on the other hand, the instructor has a mannerism which distracts attention from what he is saying to how he is saying it, this too is apt to appear in exaggerated form on the monitor.[8]

"I Like (Dislike) ETV Because . . ."

Up to this point we have given no consideration to substantive reasons why college teachers like or dislike ETV. The most general response of college educators in expressing reasons for liking or disliking ETV relates to the quality of instruction. This seems only natural since teaching is a primary professorial function.

Over the years, various studies have asked professors to express their beliefs about the effects of ETV instruction on the overall quality of the instructional program. The responses are shown in TABLE 14. It seems clear that in the six-year period represented by the data there has been some tendency for professors to evaluate ETV more favorably for the quality of instruction it permits. Equally notable in TABLE 14 is the relative decline of faculty evaluations suggesting ETV is worse than traditional methods of instruction.

In the light of our knowledge that ETV is not quite as effective as face-to-face instruction, it is somewhat surprising that through time faculty opinion becomes more favorable regarding the quality of instruction under ETV. Are professors insensitive to differences between quality among teaching methods? Are professors conformists whose opinions about features of an innovation tend, over time, to conform to the claims of proponents? Or, finallly, are the quality differences of such small magnitude as to be relatively difficult to perceive and experience when evaluating ETV against face-to-face teaching?

Since we have already established that ETV and face-to-face media do not differ as to the results they produce, except for two-way ETV, we are inclined to the last interpretation. The intuitive evaluation of the differences among teaching methods are either grounded in preconceptions about their relative merit, or in observations and experiences providing empirical bases for comparative judgments. We have already established that among professors there is a preponderance of favorable or neutral

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[8] "An Evaluation of CCITV in Los Angeles Junior Colleges," p. 59.

Table 14

THROUGH TIME PROFESSORS HAVE BEEN LESS INCLINED TO CONSIDER ETV OF WORSE QUALITY THAN CONVENTIONAL INSTRUCTION

QUESTION: *Has ETV teaching had any effects on the quality of the instructional program?*

					EFFECT OF ETV ON QUALITY OF EDUCATION	
Source-Study No.	Year of Study	Academic Institution	ETV Teaching Experience	N	Same or Better*	Worse
32	1955-56	Penn. State U.	Non-TV Teachers	177	29%	64%
	1956-57			140	33	57
	1957-58			143	40	54
	1958-59			136	84	15
	1956-57		TV Teachers	15	54	46
	1958-59			16	87	13
28 (p. 55)	1957	Ore. College of Educ.	Non-TV Teachers	40	80	0
	1959			28	64	7
	1957	Oregon State U.		256	75	18
	1959			171	52	10
	1957	U. of Oregon		208	67	18
	1959			123	40	8
	1957	Willamette U.		50	40	44
	1959			26	22	37
34 (p. 29)	1961-62	Oregon Study	TV Teachers	17	94	6
29 (p. 10)	1961	U. of Minnesota	Total University	892	43	35

* Residual response category includes: No Opinion, Don't Know, and no response.

attitudes toward ETV in general. Hence, there is no reason to expect that high proportions will consider ETV a poorer quality educational medium than face-to-face instruction. We have also etsablished that there are no measured differences in student performance between ETV and face-to-face instruction, except for two-way TV instruction. Thus, professors have no sharply etched experiential base from which to draw their conclusions.

Under these circumstances we might therefore expect that the favorable or neutral general attitudinal climate provides a setting in which the utilization of ETV through time might very well lead to a belief that its quality as an educational method is equal to or better than face-to-face instruction.

The results of the Minnesota study (shown in TABLE 15) confirm close correspondence between beliefs about the quality and general attitudes toward ETV instruction. You will note that three-fourths of the professors who believe that TV instruction is of higher quality than regular instruction also have a favorable attitude toward it. On the other hand, those who believe TV offers lower quality instruction than traditional methods represent only about one-quarter of the group who are favorable about utilization of ETV. It is clear that belief in the quality of ETV and a generally favorable attitude toward its employment go together. Incidentally, it should also be noted that the largest single group of respondents in this study were the professors who had not yet decided about the quality of TV instruction. This group, however, also had over half its number expressing neutral attitudes toward use of ETV in the university and almost 40% who were favorable toward general employment of ETV. Thus, among the undecided regarding quality of ETV instruction, 94% either favored or were neutral with respect to its general employment in the university.

Table 15

IF ETV IS BELIEVED TO BE QUALITY INSTRUCTION, GENERAL ATTITUDE IS ALSO FAVORABLE

Attitude Toward General Use of ETV in University Instruction	ATTITUDE TOWARD RELATIVE QUALITY OF ETV INSTRUCTION			
	ETV Instruction of Higher Quality	No Difference	Undecided	ETV Instruction of Lower Quality
Favorable	75%	65%	39%	27%
Neutral[a]	22	31	55	41
Unfavorable	3	4	6	32
Totals	100% (179)	100% (130)	100% (365)	100% (218)

Adapted from: 29, p. 37.

[a] Includes Neutral, Undecided, and no response.

The importance of the general attitudes of those undecided about the quality of TV instruction should be emphasized. It is from among this group of professors that converts to ETV are likely to be gained since we now know that those who actually have experience with ETV are overwhelmingly favorable toward it. Since the majority of the undecided have very neutral attitudes toward ETV, providing them with experience with it would very likely move them into a favorable orientation toward it.

Many of the faculty attitude questionnaires included open-ended questions concerning professors' judgments of the role of TV in the university. It is important to note that professors overwhelmingly specified large lower-division survey courses, enrichment of existing courses, and courses which utilize visual demonstrations as those areas most adaptable to television instruction.[9]

The largest single factor on which professors fault instructional television as compared with traditional teaching methods is the loss of the personal teacher-student relationship. In the Miami Unversity study, for example, in an open choice response to the question, "What do you perceive to be the greatest disadvantages of instruction by TV?", professors replied "loss of personal contact" more than twice as often as the total number of other disadvantages cited.[10] This disruption of the traditional role of the university professor interacting with his students in a personal Socratic manner begins to unmask some of the more important reasons why professors accept or reject the prospect of ETV. In the following sections we will examine in detail the expectations and fears of the professor in relation to instructional television.

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[9] See esp., Starlin and Lallas, *op. cit.*, p. 55 ff., Armson, Baich, and Palmer, *op. cit.*, p. 31 ff., and, Macomber and Siegel, *op. cit.*, pp. 53-54.

[10] See Macomber and Siegel, *op. cit.*, pp. 54-55, and p. 50 for TV teachers' comments. It should be noted, however, that loss of personal contact was also the largest deficiency reported in the disadvantages of teaching large classes. See also: C. R. Carpenter and L. P. Greenhill, *Instructional Television Research, Report Number Two: An Investigation of Closed-Circuit Television for Teaching University Courses* (University Park, Pa.: Pennsylvania State University, Spring 1958), p. 69; Starlin and Lallas, *op. cit.*, p. 54; Stecklein and Olson, *op. cit.*, p. 15; Hull, *op. cit.*, p. 35; T. C. Pollock, *CCTV as a Medium of Instruction, 1955-1956* (New York: New York U., 1956), p. 17; Oliver M. Stone and J. R. Martin, "Instruction in Graphics by CCTV," (Cleveland, Ohio: Case Institute of Technology, Research Report No. 948-6, 1959), p. 13; R. D. Colle and R. S. Albert, "College teachers' attitudes toward CCTV instruction," *Audio-Visual Communication Review*, 8, 1958, p. 119; R. E. Dreher and W. H. Beatty, *An Experimental Study of College Instruction Using Broadcast Television* (San Francisco: San Francisco State College, 1958), p. 51; "East Carolina College CCTV Experiment," pp. 39-41; and John R. Martin, *et. al.*, "Studies in Educational CCTV," (Cleveland, Ohio: Case Institute of Technology, 1958), p. 35.

ETV Impact on the Instructor

In this section we are concerned with professors' evaluations of the major effects of ETV on their work load, and the structure of their jobs. Beginning with the more tangible reported effects on work load and general working conditions, we will move to evaluations of certain administrative and organizational factors concerning possible bases for setting ETV academic policy. Because of the nature of these data, we will be dealing almost exclusively with the attitudes and evaluations of the TV professor.

COURSE PREPARATION TIME

Of the studies dealing with reported effects of TV teaching on the amount of course preparation, all of them state that professors require considerably more time to prepare for a TV lecture than a comparable non-TV lecture.[11] Some of the studies explain this by the increased administrative burdens that a TV course involves (coordinating the activities of additional class sections, working with discussion leaders and receiving-room instructors, meetings with TV technicians and audio-visual staff, etc.), while others explain additional preparation in terms of the fact that a television lecture is circulated to a wider, perhaps more critical, audience (consisting of colleagues, university administrators, and the community-at-large), and, possibly, even for posterity (the use of video tapes). Still others mention that the particular character of television requires more attention to a logically organized presentation, and consequently more time must be spent preparing a TV lecture.

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[11] See Macomber & Siegel, *op. cit.*, pp. 56-58; Timmons and Fey, *op. cit.*, pp. 16-17; Pollock, *op. cit.*, p. 18; "CCITV in Los Angeles Junior Colleges," pp. 53-54; Klapper, *op. cit.*, pp. 62-63; Robert H. Davis and F. C. Johnson. "Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms" (East Lansing, Mich.: Michigan State U., Project Report No. 202, 1966), pp. 30-31; "East Carolina College CCTV Experiment," pp. 42-43; John R. Martin, *op. cit.*, p. 35; "Survey of Faculty Attitudes of TV Instruction: Summary of Results 1955-59;" Fresno State College, "Preliminary Report of the Committee Evaluating Education 107 TV" (Fresno, Cal.: Fresno State College, May 1957), p. 7; A. A. Blatherwick, "Teaching mechanics via closed-circuit television," *Journal of Engineering Education*, 52:5, February 1962, p. 321; Clifford G. Erickson and H. M. Chausow, "Chicago's TV College: Final Report of a Three Year Experiment of the Chicago City Junior College in Offering College Courses for Credit via Open Circuit Television" (Chicago: Chicago City Junior College, August 1960), p. 18 ff.; A. L. Fritschel, "Teaching general psychology by closed circuit television." *Western Illinois University Bulletin*, 37:2, October 1957, p. 72; and L. P. Greenhill, "Closed-Circuit Television for Teaching in Colleges and Universities" (University Park, Pa.: Pennsylvania State University, May 1959, revised March 1964).

Reported times to prepare a one-hour TV lecture vary tremendously.[12] TABLE 16 presents the most systematic account[13] of the total preparation time required to present a one-hour TV lecture. The investigators in the study caution that "there really is no such thing as a 'normal' expenditure

Table 16

IT TAKES FIVE TO TEN HOURS PREPARATION FOR ONE HOUR ON CAMERA

	CLOSED CIRCUIT TV (N = 12)		OPEN CIRCUIT TV (N = 7)	
Activity	Median Hrs/wk	Range	Median Hrs/wk	Range
Preparation for presentation	2.3	0.0 - 3.7	5.5	3.0 - 12.0
Arranging for and personally preparing visual aids, demonstrations, etc.	0.8	0.0 - 4.8	1.8	0.0 - 4.3
Training and coordinating activities of graduate assistants and other staff	0.1	0.0 - 1.5	0.0	0.0 - 0.5
Rehearsals, meeting with director, make-up, etc.	0.6	0.0 - 2.5	1.0	0.0 - 4.3
Conferences with individual students	0.5	0.0 - 2.3	0.3	0.0 - 2.0
Clerical duties, constructing examinations, etc.	1.0	0.0 - 5.3	1.0	0.3 - 5.5
Miscellaneaous (including travel to studio)	0.0	------------	0.0	0.0 - 0.7
Total All Activities	5.3	3.1 - 16.4	9.6	8.9 - 18.8

Adapted from: 22, Miami University, 1960, p. 57.

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[12] Pollock, *op. cit.*, p. 18, reports that for an N of 12, preparation time varied from 8-10 to 40 hours for one TV lecture. The average estimate was 19 hours. However, he cautions that these lecturers were responsible for presenting only a few special lectures, and that the preparation time might differ for regular TV teachers; Timmons and Fey, *op. cit.*, p. 17 (N=17), report that from 8 to 20 hours of preparation is considered necessary to prepare one ETV lecture.

[13] Macomber and Siegel, *op. cit.*, p. 56, "... each instructor was requested to complete a sequence of fourteen daily activity logs upon which he was to keep an accurate record of his activities for two complete weeks spread over a six-week period: i.e., Monday and Tuesday of the first week, Wednesday and Thursday of the second week, etc."

of time. In any university it is likely that some instructors will labor as much over a single three-credit course as others do over their full load."[14] In order to provide a comparative evaluation of the time it takes to prepare a one-hour lecture for the traditional classroom situation, via closed circuit television, and via open circuit television, the authors of the Miami U. study secured the data on preparation of regular classes for comparison purposes (see TABLE 17). Television instruction takes from three to almost six times as much preparation time as a conventional classroom lecture. It is likely that as the use of television becomes a regular and established teaching medium in the university, the difference between preparation and presentation times for each of the two media will diminish. In fact, with the use of video tapes, it is even conceivable that the expenditure of time required for a one-hour TV lecture will equal zero.

TABLE 17 leads directly to a consideration of the appropriate course load for the TV teacher. In all the studies that considered this point,[15] professors indicated that they should receive additional compensation for teaching a TV course. Overwhelmingly, the compensation stipulated was in terms of course load reduction rather than increased financial remuneration, although in one study almost one-quarter of a sample of 554 professors advocated both reduced time and extra money.[16] Most instructors agreed that a three hour per week course taught over television

Table 17

TV PREPARATION TIME IS EXPENSIVE FOR A ONE-HOUR LECTURE

TYPE OF TEACHING MEDIUM	MEDIAN HOURS	N
Face-to-face lecture	1.7	26
Closed circuit television lecture	5.3	12
Open circuit television lecture	9.6	7

Adapted from: 22, Miami U., 1960, pp. 56-58.

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[14] *Loc cit.*

[15] See Starlin and Lallas, *op. cit.*, pp. 59-60; Macomber and Siegel, *op. cit.*, pp. 56-57; Timmons and Fey, *op. cit.*, pp. 16-17; Dreher and Beatty, *op. cit.*, p. 47; and "CCITV in Los Angeles Junior Colleges," pp. 57-59. See also, K. W. Shoemaker, "Attitudes of Members of a University Faculty Toward Operations of a University-Owned Educational Television Station," (Ohio State U., Department of Speech, Study No. 15, June 1957), p. 3.

[16] See Starlin and Lallas, *op. cit.* p. 60, Table 72.

should be equivalent to from one-half to three-quarters of a normal course load, although professors stating that it should constitute a full time assignment were not uncommon.[17]

Justification given by TV instructors for downward adjustment of their course loads included the increased number of students taught, the cost saving, and the lowering of the resultant demand on colleagues' teaching time. Because of large student enrollment in television courses, TV teachers report that greater time must be devoted to marking assignments, having conferences with individual students, and performing general clerical and administrative duties. In addition to increased preparation time required for teaching by television, previously mentioned, TV teachers noted that larger classes could be handled with non-academic clerical help (a cost saving). TV instructors also claimed that their teaching colleagues were less burdened because of "possible conservation of the total teaching staff in light of the duties assigned the ETV teacher."[18]

CONTROL OF TV INSTRUCTION POLICY

These considerations in turn lead to the question of which body or bodies should assume the responsibility for setting television policy. Most University of Minnesota faculty members (84%) agreed that

> ... such decisions should originate at the departmental level, alone, or in combination with college or university-wide policy groups. Within this group, 29.8 per cent felt that the department alone should determine policies affecting television productions by its own faculty. A third (34.5 per cent) believed that departmental policy should be coordinated with other departments by a college policy group, while others (19.5 per cent), apparently thinking in even broader terms, suggested that departmental policy should be coordinated by a university-wide policy committee.[19]

The majority were of the opinion that matters pertaining to quality and standards of television production should have a university-wide base, but that substantive policy should originate at the departmental or college levels.

In regard to the rights of television teachers, Dean Fred S. Siebert of Michigan State University, conducted a study under the auspices of the American Council on Education, and found that most colleges and universities (70%) "had developed no contractual agreement or policy statement."[20] In an analysis of this issue, Koenig summarizes the present state of affairs:

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[17] See Macomber and Siegel, *op. cit.*, p. 57, Table 10; Timmons and Fey, *op. cit.*, p. 17; and Dreher and Beatty, *op. cit.*, p. 47.

[18] Timmons and Fey *op. cit.*, p. 16. See also, "CCITV in Los Angeles Junior Colleges," p. 59, Table 27; and Macomber and Siegel, *op. cit.*, p. 56.

[19] Stecklein and Olson, *op. cit.*, p. 19.

> The television teacher's compensation varies widely from one institution to another. Ordinarily the teacher does not receive additional pay for appearing on educational television. Working conditions vary as widely as compensation practices. Although many schools provide release time for television teaching, there is no specific standard for determining how much release time the teacher will receive. Finally, teachers are not legally protected from the improper use of their programs at another date; if a program is out of date the teacher has no legal right to stop its distribution.[21]

The whole issue of television teachers' rights is extremely complex and by no means resolved. This kind of issue illustrates how a major technical innovation may have impact far beyond its point of direct application. Special compensation and rights of control over performance are simply two ramifications in the areas of prerogatives and academic freedom that result from the utilization of ETV in higher education.

Personal Impact of ETV

On a more personal basis, the effects of ETV on the university professor are numerous. There exists a substantial degree of uncertainty regarding how the ever-increasing use of ETV will affect the teacher's role. For example, issues related to freedom of expression, job security, morale, and tension all have been reported as being affected by instructional television.[22]

ACADEMIC FREEDOM

TABLE 18 summarizes professors' response to the question: "In your opinion will the professor have less freedom of expression teaching on TV than he does in the conventional classroom?" It appears that, over

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[20] Fred S. Siebert, *Copyrights, Clearances, and Rights of Teachers in the New Educational Media.* (Washington: American Council on Education, September 1964), p. 48.

[21] Allen E. Koenig, "Rights for Television Teachers," in A. E. Koenig and R. B. Hill (eds.), *The Farther Vision: Educational Television Today.* (Madison, Wis.: University of Wisconsin Press, 1967), p. 255.

[22] See Starlin and Lallas, *op. cit.*, p. 59; Armson, Baich and Palmer, *op. cit.*, p. 33; Timmons and Fey, *op. cit.*, pp. 20-23; Pollock, *op. cit.*, p. 19; Klapper, *op. cit.*, p. 61; Stecklein and Olson, *op. cit.*, p. 13; "East Carolina College CCTV Experiment," p. 43 ff.; and Pennsylvania State U., "Survey of Faculty Attitudes on Televised Instruction, 1955-1959," Question 9.

Table 18

THROUGH TIME, ETV IS PERCEIVED AS LESS OF A THREAT TO ACADEMIC FREEDOM—CASE 1

QUESTION: *In your opinion will the professor have less freedom of expression teaching on TV than he has in the conventional classroom?*

				EFFECT OF TV ON FREEDOM OF EXPRESSION		
Source-Study No.	Year of Study	Academic Institution	N	Yes	No Answer	No
28 (p. 59)		University of Oregon	208	63%	20%	17%
Oregon		Ore. College of Educ.	40	62	28	10
Study	1957	Oregon State U.	256	61	18	21
		Willamette U.	50	64	14	22
01 (p. 33)		University of Oregon	39	69	5	26
Oregon		Ore. College of Educ.	32	22	6	72
Study	1965	Oregon State U.	42	43	14	43
		Portland State College	17	41	6	53

time, as faculty members become more intimately acquainted with the facts of instructional television, and consequently give less credence to its mythology ("Big Brother is watching you"), the tendency is for them to attribute less negative effects on freedom of expression to ETV. Even at the University of Oregon the shift is in the same direction for, although the proportion claiming a negative effect increases slightly, the proportion claiming no effect increases more.[23]

TABLE 19 reports additional data on the ways in which instructional television personally affects the university professor. Both TV professors and those with no television teaching experience were asked: "Do you think that using TV as an instructional device for teaching large classes is or will be enough of a threat in any way (that is, fewer jobs for teachers, violation of classroom privacy, etc.) to the teaching profession in general to be opposed on these bases alone?" Here the structure of response is much different from the previous table. The personally threatening aspect of ETV for these professors is negligible. Overwhelmingly, they find no cause to oppose television teaching on these grounds, although the "uncertain" or "no answer" category does in some cases approach one-quarter of the sample.

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[23] The Timmons and Fey Oregon Study (*op. cit.*, p. 5) is of the ETV teachers involved in the inter-institutional Oregon project. In summarizing the attitudes of the 17 TV teachers on the question of the inhibiting effect of the medium on freedom of expression, they conclude: "Most of the ETV teachers held that they had complete freedom to teach and that impositions on this freedom, in the form of uniformity or inflexibility, did not present a major problem. If any impositions might result from ETV, it was felt that the instructors receiving the telecast and leading discussions might be the ones most affected."

Table 19

THROUGH TIME, ETV IS PERCEIVED AS NEVER HAVING BEEN A THREAT TO ACADEMIC FREEDOM OR EMPLOYMENT—CASE 2

QUESTION: *Do you think that using TV as an instructional device for teaching large classes is or will be enough of a threat in any way (that is, fewer jobs for teachers, violation of classroom privacy, etc.) to the teaching profession in general to be opposed on these bases alone?*

				ATTITUDE TOWARD ETV AS A THREAT		
Academic Institution	Year of Study	ETV Teaching Experience	N	Yes	No Answer	No
Pennsylvania State U.	1955-56	None	177	7%	23%	70%
	1956-57	None	140	6	13	81
	1957-58	None	143	7	19	74
	1958-59	None	136	5	24	71
	1956-57	TV Teachers	15	—	6	94
	1958-59	TV Teachers	16	7	7	86

Source: 32

The data reported in TABLES 18 and 19 point in the same direction, but with the beliefs being of markedly different magnitude. It seems probable that the defense against employing ETV will rest on traditional arguments, so that those not favorable will see threats to academic freedom while those more favorably disposed will not.

PERSONAL STRESS

Reports of work tension and strain experienced by TV teachers are fairly common—by those teaching via open circuit more than by those teaching through a closed circuit.[24] However, both groups report that tension and strain tend to diminish as they become more accustomed to the medium. Newness of the situation, unfamiliar surroundings, the unknown public, lack of student contact, consciousness of a strict time schedule, and worry about future productions are all factors contributing to this anxiety.

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[24] For open circuit TV studies see: Timmons and Fey, *op. cit.*, pp. 21-23; and Dreher and Beatty, *op. cit.*, pp. 46-47. For closed circuit TV studies see: Pollock *op. cit.*, p. 19; Klapper, *op. cit.*, pp. 61-62; and "East Carolina College CCTV Experiment," p. 43 ff.

PROFESSORIAL IMAGE

We now may discuss ETV as it affects the TV professor's image in relation to his colleagues, his students, and the general public. TABLE 20 presents faculty opinions regarding the prestige effects of television teaching. Except for the dominant attitude that TV teaching will enhance the professor's image in the eyes of students, the majority of faculty members feel that no differential prestige will accrue to the TV teacher. However, a significant proportion do feel that the prestige of the professor teaching via television will be enhanced, suggesting once again that professors see nothing inherently wrong with ETV. Rather it is its extended organizational implications for the role of the teacher that engender uncertainty and, in some cases, hostility toward it.

Table 20

TV TEACHING DOESN'T DECREASE THE PROFESSOR'S PRESTIGE, BUT IT MAY INCREASE IT SOME

QUESTION: *How will TV teaching affect the instructor's prestige?*

Source-Study No.	Year of Study	Effects from Standpoint of Type of Prestige Effect	Television Teaching Experience	N	PRESTIGE EFFECTS OF TELEVISION TEACHING		
					Increase	No Difference*	Decrease
28 (pp. 58-59) Oregon Study	1957	Students	None	554	55%	29%	4%
		Staff Members	None	554	41	42	6
01 (p. 35) Oregon Study	1965	Staff Members	None	130	22	56	2
34 (pp. 21, 29) Oregon Study	1964	External Image	TV Teachers	17	29	65	6

* No Difference response category includes Don't Know and no answer.

In this section we have attempted to describe some of the major effects ETV has on faculty members, particularly TV teachers.[25] We have found that TV lectures are considered better prepared and organized, and it is also generally acknowledged that TV lectures take more time in preparation. Also, we have found that TV teachers will be accorded at least standard respect in their job, and may even be accorded enhanced prestige by their colleagues, their students, and the general community. Fears that TV instruction will invade academic freedom are not widespread. The TV instructor experiences stress, partly because of the demands of the teaching itself, and perhaps, also, because it is a change from the usual mode of instruction. The evidence suggests that the reaction against ETV is largely emotional (well intentioned though it might be), there being little substance to the attitude that the introduction of ETV will deteriorate the quality of college instruction.

Professors' View of Impact of ETV on Students

Faculty concerns about the effects of instructional television upon students focus on whether students are as interested in and as attentive to television instruction as they are to conventional instruction; whether they learn as much, are as highly motivated, and whether they have the ability for independent study that ETV reportedly requires.

GENERAL STUDENT REACTION

In both the Pennsylvania State and Oregon studies professors were asked if they had talked with students and/or colleagues about their TV instructional programs, or had heard them discuss the programs. Those who responded affirmatively were then asked: "How do you think the majority of them feel about it?" TABLE 21 shows how university professors estimate that the majority of students feel toward ETV.

The results of both studies reflect a general decline over time in favorability and an increase in negative evaluations of ETV attributed to students. The direction of attributed attitude change is consistent with our previous findings of how professors' attitudes change over time (see

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[25] See Erickson and Chausow, *op cit.*, pp. 13-34 ("TV College in Action") for a relatively comprehensive description of the administration of a TV college, the selection and scheduling of courses, the selection of TV instructors, the preparation and presentation of courses and examinations, and the teaching-time allowances for telecourses. See also Francis A. Gaul, "What are the pros and cons of teaching by television?" in *Current Issues in Higher Education*, 1958 (Washington, D.C.: Association for Higher Education, National Education Association), pp. 230-232, for a descriptive account of an instructor's first reactions to teaching by television.

Table 21

FACULTY SAY STUDENTS' REACTION TO ETV IS NEUTRAL TO STRONGLY NEGATIVE

QUESTION: *How do you think the majority of students feel about the TV instructional program?*

Source-Study No.	Year of Study	Faculty Estimators' ETV Teaching Experience	N	ESTIMATES OF STUDENTS' ATTITUDES Favorable	Neutral	Unfavorable
32 Penn.	1955-56	None	60	20%	23%	57%
State U.	1956-57	"	89	15	27	58
	1957-58	"	107	12	17	71
	1958-59	"	108	7	10	83
	1956-57	TV	15	53	20	27
	1958-59	Teachers	16	47	13	40
28 (p. 56)						
Oregon	1957	None	181	40	44	16
Study	1959	"	162	25	45	30

* See notes, Table 1.

TABLES 3 and 5). Thus, in their estimates of the students' position, professors may be projecting their own attitudes.

The magnitude of the discrepancy between the professors' estimate of student attitude and actual expressed attitude may be judged by comparing TABLES 21 and 22. It is quite clear that the majority of the students in the Oregon study favored ETV even before the system was introduced in the cooperating schools, and continued to favor it after TV instruction began. If we were to combine the student undecided percentage with the percentage of those favorable, we would see an overwhelmingly strong support for ETV among students.

If we compare only the Oregon results for the total student population, the professors' estimates were reasonably close to the actual students' attitudes before the IITV program was introduced. After the program actually went into effect, the students became more favorable with a corresponding reduction among the "undecided." Notably, the professors estimated the students' attitudes closely before the experiment began but made poor estimates, in the wrong direction, by significant amounts, after some experience with ETV.

Table 22

STUDENTS RECEIVE ETV FAVORABLY BEFORE AND AFTER IT IS INTRODUCED

Source-Study No.	Year of Study	Academic Institution	N	STUDENT ATTITUDES TOWARD TV		
				Accept	Undecided	Oppose
28	1957	Oregon College	90	52%	38%	10%
	1959	of Education	133	67	22	11
	1957	University	352	47	39	14
	1959	of Oregon	438	50	28	22
	1957	Oregon State	255	44	36	20
	1959	University	152	52	32	16
	1957	Willamette	45	51	33	16
	1959	University	40	58	25	17
	1957	Total	742	47	37	16
	1959	Oregon Study	763	54	28	18

Source: 28, adapted from Tables 18, 19, 20, 30, 34 and 36; pp. 24, 28, 30 and 31.

To understand resistance to change among users and consumers of an innovation, it is necessary to evaluate separately these respective groups. To use the guesses by one group about the other (and the usual case would be to employ users' guesses about consumers' reactions) may produce manifestly incorrect data on which to base a policy decision.

HOLDING ATTENTION

TABLE 23 measures faculty opinion regarding the attention-holding capabilities of TV instruction compared with conventional instruction. In nearly all cases, there are more professors (in most instances over 50%) who estimate that attention of students is either no different or better in TV instruction than those who estimate it is worse, and in the Oregon study the "better" and "no different" categories show a general increase over time. When we come to our analysis of student opinions, we can compare how students themselves evaluate the relative attention-commanding powers of ETV. Generally, professors' evaluations of TV instruction are lower than the students'.

STUDENT INTEREST

The faculty seems to hold the opinion that ETV is an adequate means

Table 23

MAJORITY OF PROFESSORS THINK ETV IS AS GOOD OR BETTER THAN CONVENTIONAL INSTRUCTION IN HOLDING STUDENT ATTENTION

				OPINION REGARDING COMPARATIVE HOLDING ATTENTION OF TV			
Source-Study No.	Year of Study	Academic Institution	N	Better	No Difference	Worse	No Opinion
28 (p. 54)	1957	Ore. College	40	28%	30%	30%	12%
	1959	of Educ.	28	39	36	21	4
	1957	Oregon	256	32	28	31	9
	1959	State U.	171	33	41	20	6
	1957	University	208	26	26	35	13
	1959	of Oregon	123	28	34	31	7
	1957	Willamette	50	12	34	42	12
	1959	University	26	27	23	50	----
29 (p. 12)	1961	University of Minnesota	892	20	23	41	16

of stimulating interest in learning. The data in Table 24 suggest that half or more of the responding faculty believe that TV is as good or better than regular teaching methods in holding student interest. Perhaps there has come to be a cynicism on the part of professors regarding student interest in academic subjects that is unaffected in any direction by the medium of instruction employed. In any event, the factor of student interest does not seem to be one of great moment in the views of the faculty regarding the impact of ETV on students.

STUDENT ACHIEVEMENT

Faculty guesses about student achievement under ETV reflect some skepticism regarding the effectiveness of ETV. As revealed in TABLE 25 more faculty believed that the ETV medium was worse than conventional media than believed it was better. Our more refined analysis in CHAPTER 1, as well as other reviews of the field, now make clear that there is no factual basis for the early faculty attitudes reported in TABLE 25. Faculty members believed facts could change their opinion as revealed in a study conducted at the State University of Iowa.[26] Faculty were asked:

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[26] See D. B. Stuit and S. L. Becker, "Some faculty reactions to teaching on CCTV," *Journal of Higher Education*, 18, 1957, pp. 339-343.

Table 24

FACULTY THINK ETV IS A MEDIA THAT MAY DO AS WELL AS CONVENTIONAL TEACHING IN STIMULATING STUDENT INTEREST

QUESTION: *ETV stimulates student learning [interest].*

				OPINION REGARDING COMPARATIVE STUDENT INTEREST IN ETV			
Source-Study No.	Year of Study	Academic Institution	N	Better	No Difference	Worse	No Opinion
28 (p. 54)	1959	Ore. Col. of Ed.	28	21%	50%	22%	7%
	1959	Ore. State U.	171	13	48	30	9
	1959	U. of Oregon	123	13	50	27	10
	1959	Willamette U.	26	15	42	43	—
29 (p. 12)	1961	U. of Minn.	892	20	20	48	12

Table 25

FACULTY THINK STUDENTS WILL DO ALMOST AS WELL WITH ETV AS WITH CONVENTIONAL INSTRUCTION

				OPINION REGARDING COMPARATIVE STUDENT ACHIEVEMENT IN ETV			
Source-Study No.	Year of Study	Academic Institution	N	Better	No Difference	Worse	No Opinion
28 (p. 54)	1957	Ore. College	40	15%	68%	5%	12%
	1959	of Educ.	28	7	86	----	7
	1957	Oregon	256	15	53	20	12
	1959	State U.	171	7	62	21	10
	1957	University	208	12	55	16	17
	1959	of Oregon	123	6	59	22	13
	1957	Willamette	50	12	40	44	4
	1959	University	26	15	23	62	----
29 (p. 12)	1961	University of Minnesota	892	7	32	38	23

"Do you believe that students could get as much from your courses as they do now if they viewed them on a closed-circuit television system while being proctored by a graduate assistant?" Only 15% (N = 160) believed that students would get as much, and yet 73% replied that they would teach on television "if evidence could be obtained indicating that students can retain as much information from a television course as they can from one taught in the conventional classroom."

Another feature of ETV that professors report has an effect on students is its requirement of independent learning.[27] Many faculty doubt that students, particularly those on the freshman and sophomore levels, are sufficiently mature to handle this experience. Even accepting the claim that TV instruction does put the student more on his own (claims by TV professors that they present more logically organized, better prepared lectures notwithstanding), there is a rather large body of literature dealing with the fact that student performance does not vary with teaching method.[28] In other words, no matter what the manner of teaching, be it by television, seminar, lecture, or independent study, student achievement (measured by final grades obtained) remains constant.

ALIENATED STUDENT SYNDROME

Finally, although we have already dealt with this factor in a previous section, we must mention that professors in their evaluations of ETV effects on students, observed a major change in the student-teacher relationship. In the 1957 Oregon study 77% of the professors (N = 554) felt that the student-teacher relationship suffers in ETV when compared to conventional instruction, and in 1959 this proportion increased to 83% (N = 348).[29] In a subsequent Oregon study, in reply to an open-ended question designed to elicit the specific effects of instructional television on students, professors (N = 130) responded "lack of student-teacher contact" almost three times more often than the next most quoted effect.[30] In the University of Minnesota study, 53% (N = 892) of the sample agreed with the statement, "Some student-instructor face-to-face contact during class hours is essential in all courses."[31]

It would appear from the foregoing that the change for the worse in the student-teacher relationship is the one point on which most professors can agree—on no other single issue does such unanimity exist. Whether the deleterious effects of instructional television on this relationship are seen as more harmful to the student or the teacher is an interesting side issue, but the fact remains that university professors regard the change in this relationship as the single most undesirable aspect of television instruction.

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[27] See Davis and Johnson, *op. cit.*, pp. 28-29; and J. J. Bennett, "Report Evaluating the Teaching of Accounting 1 by CCTV," (U. of Alabama, 1958), p. 9 ff.

[28] See Robert Dubin and Thomas Taveggia, *The Teaching-Learning Paradox*, *op. cit.*

[29] Starlin and Lallas, *op. cit.*, p. 54.

[30] Armson, Baich, and Palmer, *op. cit.*, p. 13.

[31] Stecklein and Olson, *op. cit.*, p. 15.

We can conclude this section by restating the mild skepticism that seems to exist among professors about student reaction and performance when subjected to the ETV medium of instruction. Professors may be projecting their own attitudes when they ascribe the opinions they do to students. Most crucial in the faculty attitude complex is concern over the student-teacher relationship as it obviously must change under ETV. Until some resolution of this issue is achieved, a more favorable climate of faculty opinion toward ETV may be difficult to develop. At the root of the resistance to this teaching medium lies a basic uncertainty as to what its effect will be on the role of the university teacher.

Pressures of Increased Student Enrollment

The relentless pressure of increasing student enrollments constantly plays upon academic decision making. Regardless of preferences for particular teaching methods, when the need to accommodate more students arises, new media as well as less preferred methods of instruction inevitably gain consideration. Many people, generally those who favor television instruction, have proposed the full-scale use of ETV as the chief method to mitigate the increasing student load problem.

Professors, however, are not ready to concede that ETV may be the most effective way to handle more students. TABLE 26 presents the results of professors' evaluations at two large universities regarding student enrollment pressures. Over three-quarters of both samples felt that either enrollment had increased but could be handled by present methods, or that it was not a particular problem. These opinions would indicate that professors view instructional television as a supplement to, rather than an alternative for, more conventional means of instruction. As the University of Minnesota report concludes: "The general tenor of these questionnaire responses suggests that faculty members do not see enrollment pressures as a motivation to change their instructional techniques, either now, or in the foreseeable future."[32]

Members of these same samples were asked to make a hypothetical choice between large sections or ETV in the face of a real jump in student enrollment. As TABLE 27 indicates, only among TV teachers does a preference for television exceed a preference for large lecture sections.

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[32] Stecklein and Olson, *op. cit.*, p. 17.

Table 26

CONVENTIONAL INSTRUCTIONAL METHODS ARE GOOD ENOUGH TO HANDLE INCREASED ENROLLMENTS

QUESTION: *What is your feeling about student enrollment pressures in your department now?*

	Pennsylvania State University[a]				Univ. of Minnesota[b]
RESPONSE	1955-1956 Non-TV Teachers N 177	1956-1957 Non-TV Teachers N 140	1957-1958 Non-TV Teachers N 143	1958-1959 Non-TV Teachers N 136	1961 All University N 892
Increased to where new techniques must be developed	14%	17%	15%	12%	10%
Increased but can be handled adequately by present methods	53	38	55	60	49
Not particularly a problem	29	36	27	25	37
Seems to be diminishing	1	3	2	2	(not included)
No answer	2	6	1	1	4
Total	100%	100%	100%	100%	100%

Adapted from:
[a] 32
[b] 29, p. 27.

It is also true, as noted previously, that preference for large class sections increases over time as the prospect of personally becoming involved with ETV becomes more likely.

In more detailed analysis of the same sample from Pennsylvania State University and the University of Minnesota where specific alternatives to handling increased enrollments without corresponding budget increases

Table 27

LARGE SECTIONS PREFERRED OVER ETV WHEN ENROLLMENT PRESSURES ARE GENUINE

QUESTION: *If because of the pressures of student enrollment it would become necessary either to teach some of your classes by closed-circuit television or to have large sections [that is, 150 or more per section], which of these alternatives would you most prefer [assistants and other factors being equal]?*

	Pennsylvania State University[a]						Univ. of Minnesota[b]
	1955-1956	1956-1957		1957-1958	1958-1959		1961
RESPONSE	Non-TV Teachers	Non-TV Teachers	TV Teachers	Non-TV Teachers	Non-TV Teachers	TV Teachers	All University[c]
Television	28%	34%	74%	22%	22%	86%	33%
Large Sections	37	41	12	54	55	7	56
No Difference	27	17	7	15	14	0	(not included)
No Answer	8	8	7	9	9	7	11
Total	100%	100%	100%	100%	100%	100%	100%
N	177	140	15	143	136	16	892

Adapted from:
[a] 32
[b] 29, p. 16.
[c] Data based on class size of 100 students or more per section.

were posed, the ETV alternative remained a viable one (see TABLE 28). It received the highest proportion of choices among the University of Minnesota faculty and was the second most frequently chosen alternative in the later years of the Pennsylvania State study. The most notable feature of the time trend data for Pennsylvania State University is the marked decline in the miscellaneous category which constituted 51% of the responses in the first survey and only 20% in the last. Perhaps this may be taken as evidence that the closer an innovation comes to impinging upon the personal behavior of an individual the more polarized the distribution of attitudes is likely to become. In this case the polarization is between the choices of increasing class size or going to ETV.[33]

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[33] Somewhat comparable questions were asked in the Oregon Study and substantial proportions of the respondents, in every case equaling or exceeding 50%, chose to extend the use of ETV as one important way to handle increased enrollments. See Starlin and Lallas, *op. cit.*, p. 58.

Table 28

IF ENROLLMENTS INCREASE AND BUDGETS DO NOT, THEN ETV IS A VIABLE CHOICE

QUESTION: *If the University were to experience substantial increases in enrollment, with no proportionate increase in budget, what would be your preference for methods of handling the increase?*

	Pennsylvania State University[a]				Univ. of Minnesota[b]
		Non-TV Teachers			All University
RESPONSE	1955-1956	1956-1957	1957-1958	1958-1959	1961
Increase class size, keep present class-hour load	11%	13%	32%	33%	23%
Keep present class size, increase class-hour load	9	7	14	11	7
Use closed-circuit TV, keep present workload	20	24	18	20	34
Keep present class size, use more inexperienced teachers	9	12	17	16	3
Other specified preferences	51	43	19	20	13
Undecided		(not included)			13
No response	0	1	0	0	7
Total	100%	100%	100%	100%	100%
N	177	140	143	136	892

Adapted from:

[a] 32

[b] 29, p. 28

The Miami University study further documents the contention that faculty view ETV as a viable choice for heavy enrollment courses. Once more under the hypothetical but practical considerations that staff and salary increases cannot rise proportionate with student enrollment, professors in this study made a clear choice of utilizing television and other large group procedures over other alternatives.[34]

TABLE 29, presenting State University of Iowa data, records faculty responses to five separate questions regarding alternatives for meeting student enrollment. Whereas the response categories of "Would be enthusiastic about teaching on TV" and "Yes, would teach on TV" do not reveal much distinction among the five questions (the variation being only from 46%-40%) the introduction of the "Would teach on TV—though reluctantly" category proposes an idea that might profitably be used in future research. The addition of this response category not only serves to make distinctions (ranging from 78% to 54%) among the questions asked, but also greatly increases the "normal" proportion of professors who are not unalterably opposed to teaching on television.[35] It would appear that the introduction of this response category serves to force active commitment from an otherwise "indifferent," "uncertain," or even "unfavorable" segment of the sample.

As far as the particular questions are concerned in this table, for example, we can see that concern for client's welfare leads nearly four-fifths of the 160 professors to accept teaching on television if it becomes a matter of turning students away. The last four questions really deal with impact upon the professor (user rather than client) and here there is a significant increase in the proportion who would not use ETV. This is consistent with our earlier emphasized conclusions that the closer ETV gets to having a personal consequence for the user, the more negative is his attitude toward it.

Along a slightly different line, a study conducted at Ohio State University of its university-owned ETV station attempted to elicit from the faculty its views concerning the function of a university broadcasting station. Twenty-two percent of the faculty (N = 434) believed that the ETV station should "provide courses (on television) which may be taken for college credit by students enrolled in the University, to relieve the pressure of increasing University registrations."[36] Whereas this is

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[34] Macomber and Siegel, p. 61.

[35] See TABLE 5 where only 30% to 40% of the faculties sampled were willing regularly to teach a TV course.

[36] Kenneth W. Shoemaker, "Attitudes of a University Faculty Toward Operations of a University-Owned ETV Station" (Ohio State U. Radio-Television Audience Study, Dept. of Speech, Study No. 15, June, 1957), p. 6.

Table 29

ETV IS ACCEPTABLE IN SOLVING CLIENTS' PROBLEMS BUT RESISTED WHEN USER INTERESTS ARE AFFECTED

Would you consider teaching one or more of your courses on closed-circuit television next year in order to reach more students simultaneously?	Teach on Television (N = 160)				
	Enthusiastically	Yes	Reluctantly	Would Not	No Response
If it became a choice of using TV or turning students away from the University?	13%	33%	32%	15%	8%
If it became a choice of using TV or increasing the teaching load?	16	27	24	22	11
If it became a choice of using TV or teaching a considerable number of courses at night?	16	26	18	29	11
If it became a choice of repeating each lecture to a second section at another time of day or using CCTV?	13	29	14	31	13
If salaries were raised commensurate with the additional number of students taught?	13	27	14	23	23

Source: 31, pp. 340-341.

not a high positive response rate relative to the other questions contained in the study, the implications of action being taken in regard to this question go far beyond the view that ETV acts as a supplement to resident college education. Here there is implied the possibility of obtaining a degree with no traditional university contact whatsoever. In light of these considerations, a 22% favorable response indicates mild acceptance not only of the prospect of ETV being used as an instructional aid on college campuses, but also an acceptance of ETV as a substitute, in part, for the college campus as it is conventionally known.

Another study[37] dealing with faculty evaluations of increasing student enrollments in relation to using ETV comes to many of the same conclusions we have already discussed. However, the researchers explicitly attribute three chief advantages to television that relate to the enrollment problem as described by the majority of the faculty interviewed. These are:

(1) the possibility of standardized subject matter, approach, testing and grading, and quality of instruction in the now widely varying sections of classes with large enrollments;

(2) the possibility of giving all students in large enrollment classes acquaintance with the teaching of departments' outstanding teachers, now available to only a few sections each quarter; and

(3) the relief to staff and in scheduling of time, rooms, materials, and equipment in the consolidation of sections now giving pressure in some departments, due to heavy enrollment.[38]

In our discussion of faculty attitudes toward the instructional problems created by increasing student enrollment, we have first of all noted that professors do not, at present (through 1961), consider them to be critical. Of the teaching methods preferred to alleviate these problems if if they arose, instructional television is cited as a viable alternative.[39] One study indicates the further possible application of ETV in the establishment of a "broadcast college." Also, we have noted the possible advantages of ETV in providing outstanding teachers and standardized lectures to all students with minimal concern over administrative details such as the scheduling of times and rooms, and the allocation of equipment and materials.

Professors Are Not Luddites

The early nineteenth century English workmen who smashed the factory machinery because they felt it threatened their jobs do not find a modern counterpart among American university and college professors. Professors express themselves as progressive and experimental regarding ETV when its use is not imminent. As the possibility of direct personal involvement increases, professorial tolerance goes down with a resultant increase in negative attitudes toward ETV.

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[37] "East Carolina College CCTV Experiment" (Greenville, N. C.: East Carolina College, 1960).

[38] Ibid., p. 55.

[39] See for example, *University of Michigan Medical Bulletin*, 27:6, November-December 1961, (entire issue), where the authors describe the advantages obtained by using CCTV in teaching clinical medicine, psychiatry, oral surgery, and nursing education to large numbers of students who even if they could group around the particular demonstration at hand, would thereby disrupt the ongoing medical situation.

We can link this "near-negative" response pattern of professors to another highly popular belief among them that the most undesirable consequence of ETV is the loss of student-teacher contact. There is a widespread belief among professors that eyeball-to-eyeball, if not mind-to-mind, contact is an indispensable condition of college-level teaching-learning.

It seems perfectly obvious that educational television has the potential of displacing large numbers of teachers from teaching. Whether or not this is consciously recognized among professors, it is a self-evident conclusion. There turns out to be a very obvious countermeasure to this potential threat, not one of smashing the TV receivers and cutting the transmission cables, à la Luddites, but rather one of insisting that the loss of student-faculty contact literally eliminates functional teaching. Thus, the professor contends that a major segment of each student's college education must occur within the voice and eye contact range measured from a professor at the podium to the last student in the far corner of the classroom. So long as the contact notion is believed, large numbers of professors will have to be employed to maintain that contact. This is an organizing principle with the military clarity of the classic Roman army whose unit of organization was based upon the belief that the centurion should have only as many men under his command as could remain within earshot of his oral direction.

Those who go the ETV route as television teachers, experience extraordinary demands upon their time and energy investments in preparing for performances and in managing the large bodies of students they teach. This naturally gives rise to new issues regarding the nature of a "normal" teaching load and the problems of compensation relating to video tape rebroadcasts of original performances.

The professor as potential user of ETV has a strong ideological position from which he can resist his personal involvement should he choose to do so. The professor as actual user of ETV faces a number of important problems ranging from the amount of his required time and energy investment to the delicate issue of who holds the rebroadcast rights to his original performances. Thus, potential and actual users of ETV have complex problems the major dimensions of which we have laid bare in this chapter.

CHAPTER 3

Students' Views on ETV

Students are the consumers of ETV. This is an accurate description but not a complete one. Students are the consumers of any and all teaching methods; however, unlike a typical consumer product market, the student as consumer of teaching does not have an open and free choice among available teaching methods or media. A student typically chooses courses on the basis of content and conformity to a curricular requirement. Once chosen, the course is taken almost without regard to the method or medium by which it is taught.

The student as consumer of teaching is part of a captive clientele. From this standpoint, what students think about ETV may be less germane to its adoption in colleges and universities than the attitudes of professors, the users of the medium. Nevertheless, if studies were to show that students have strong negative attitudes toward the medium, this might influence adoption of ETV. The student influence might be direct when measured and taken into account in making the academic decisions regarding utilization of ETV. Student influence might also be indirect if it serves to reinforce the professorial attitudes toward ETV and thereby influence the user orientations.

Having suggested that students do not constitute a fully free market for competing media of instruction, we can, at the same time, ascribe some influence to their collective attitudes about ETV. It is, thus, useful to review student responses to ETV as one significant influence upon its utilization at the college level.

In General, ETV Does Not "Bug" Students

The evidence is strong that students are captive consumers of the instructional methods and media to which they are subjected. Interestingly enough this conclusion is borne out in some of the comparative studies of college teaching media. Researchers on college-level ETV have been sensitive to the "captive" character of the student body and have gathered data on this point.

Over a ten year period five different studies have suggested that students have a distinct preference for the particular method or medium of instruction to which they are being subjected at the time their attitudes are measured. For example, Parsons (1957) concluded that:

> Students' preferences among the three experimental instructional treatments—as measured both prior to and immediately following the course—bore a stable, highly significant positive relationship to the treatments to which they had actually been arbitrarily assigned.[1]

In the following year Becker (1958) reached substantially the same conclusion: "Students who had experienced the course taught by a particular method tended to be far more favorable toward that method than students who had received other types of instruction."[2]

In the Illinois study, Janes (1961) stated the same general conclusions:

> The average of the television class was definitely in favor of the experimental presentation, and the average of the control group predominantly favored large classroom lecture. Statistically these differences were significant at the .001 level, and they indicate that... students prefer the type of presentation which they have experienced.... This statistic suggests that perhaps there is a certain fatalistic acceptance on the part of students that whatever mode of presentation they experience for the duration of a course is most satisfactory to them.[3]

Two years later (1963) Gordon found that students under a variety of instructional circumstances generally reveal post-experimental attitude scores more favorable than pre-test for all teaching methods and media.[4] In other words, students taught via TV do not differ either in their initial evaluation or in their increased favorableness over time from students taught by other media.

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[1] Thomas S. Parsons, "A Comparison of Instruction by Kinescope, Correspondence Study and Customary Classroom Procedures," *Journal of Educational Psychology*, 48, (1957), pp. 32-33.

[2] Samuel L. Becker, *et. al.*, *Teaching by the Discussion Method.* (Iowa City: State University of Iowa, 1958), p. 18.

[3] Robert W. Janes, "An Educational Experiment with On-Campus Open-Circuit Television," *Journal of Educational Sociology*, 34, (1961), pp. 305-306.

In the most recent study Davis and Johnson (1966) concluded: "When data are summarized across courses, it is clear that most students prefer the condition under which they actually receive the course lecture material."[5]

Janes has drawn the appropriate conclusion from these data: "This statistic suggests that perhaps there is a certain fatalistic acceptance on the part of students that whatever mode of presentation they experience for the duration of a course is most satisfactory to them." It could hardly be otherwise in a market of consumers that is restricted like the students' market of available teaching media and methods.

We start our analysis of student consumers with strong evidence that they are passive acceptant consumers of whatever teaching methods and media professors are willing to provide. This passive consumer orientation must be kept in mind for it definitely colors the ways in which students view ETV.

Overview from a Classic Study

The Carpenter and Greenhill study at The Pennsylvania State University was a classic comparative analysis of educational television. Their conclusions still stand as an adequate summary of major features of student reaction to ETV. We briefly summarize their analysis as an introduction to the fifteen years of follow-up research.[6]

The five major conclusions may be summarized as follows.

(1) Through time the general acceptance of ETV by students has increased.

(2) Within a given course, as the course unfolds, student opinion about instruction by TV is polarized toward liking or disliking with a

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[4] Oakley J. Gordon, "Psychology 5 via Television, Spring Quarter 1963," (Salt Lake City: University of Utah, 1963).

[5] Robert H. Davis, and Craig F. Johnson, "Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms," Project Report No. 202, (East Lansing, Mich.: Educational Development Program, Michigan State University, May 1966), p. 17.

[6] C. R. Carpenter and L. P. Greenhill, *Instructional Television Research, Report No. Two.* (University Park: The Pennsylvania State University, Spring, 1958), p. 83.

corresponding reduction in the proportion of students who have no opinion or are indifferent. The shifts are more toward the positive than the negative attitudes.

(3) The distribution of attitudes when compared from one course to another shows considerable variation. These between-course variations seem to be more a function of the non-TV elements of the course than those features associated directly with television.

(4) As the novelty of ETV wears off, students are less sensitive to its technical features and come to accept it as an instrumental feature of their instructional environment.

(5) Students have apparently reached the conclusion that there is a positive selectivity in favor of getting the best instructors in ETV courses.

The summary conclusions set the stage for the following discussion. Educational television seems to have a kind of benign impact upon the student consumer. He sees it increasingly as a standard feature of his educational environment and apparently tends to evaluate it for what it does rather than what it is.

Context Affects Attitudes

The context in which a question is posed is likely to influence the degree of favorableness expressed by college students toward ETV. We can illustrate this generalization by contrasting responses to a general question about ETV with evaluations of a given course taken on television. Both of these reactions are, in turn, compared with student reaction to choosing a conventional course over a TV course.

During a period of eleven years a number of researchers have asked students how they felt about instructional television in general. The responses are indicated in TABLE 1. It would appear from the results shown in the table that half or more of the students react favorably toward ETV. The data for the Oregon study do suggest that the proportion favoring ETV increases if the respondents have had a TV course.

There is some question as to whether through time there is a marked increase in the degree of favorableness in the student evaluation of ETV. If we compare the 1957-59 results in the Oregon schools for those who have had one or more courses taught by TV with the student attitudes in these same schools in 1962 and 1963, there has been a decline in proportion favorable to ETV in two of the three schools, with an increase in one. However, comparisons on a one-year interval between 1962 and 1963 in

Table 1

STUDENTS RECEIVE ETV FAVORABLY AND EVEN MORE FAVORABLY AFTER THEY HAVE EXPERIENCED IT

QUESTION: *What do you think of instructional television in general?**

Source-Study No.	Year of Study	Academic Institution	PROPORTION FAVORABLE TO ETV**			
			Relation to TV Course			
			Before Taking		After Taking	
			N	%	%	N
256, p. 54	1955-56	New York U.	337	65	65	312
254, p. 3	1956	Penn. State U.			62	95
265, pp. 24, 28, 30, 31 Tables 18, 19, 20, 30, 34, 36	1957-59	Ore. Col. of Ed.	90	52	67	133
		U. of Oregon	352	47	50	438
		Oregon State U.	255	44	52	152
		Willamette U.	45	51	58	40
242, p. 93	1962	U. of Illinois			59	160
202, pp. 6-8 Tables 1-4	1962	Ore. Col. of Ed.			38	77
	1963				58	61
	1962	U. of Oregon			52	184
	1963				68	140
	1962	Oregon State U.			38	193
	1963				48	221
216, p. 22	1965	Michigan State U.			47	136
	1966				59	136

* The difference in the percentages between Favorable (including any degree of favorableness) and 100% is represented by Neutral or Indifferent, Unfavorable (including any degree of unfavorableness), and Undecided, Don't Know, and no response.

** In this analysis we have concerned ourselves only with students enrolled in credit courses on campus. Where attitudes are polled over several semesters, we have presented only those attitudes elicited in the final semester.

(NOTE: The full citation to source is identified by study number in the **Bibliography** related to the special subject of this and each succeeding table.)

the three Oregon schools and between 1965 and 1966 at Michigan State University all show an increase in the proportion of student respondents who are favorable toward ETV. We are inclined to the conclusion that habituation is an important feature in developing a favorable attitude about an environmental condition. We think that students develop a tolerance for new teaching methods after they have some experience with them.

If you glance back at the first table presenting the most general attitudes of faculty toward ETV you will note that before either students or faculty have had any personal involvement in a television course, the comparative data show for the same Oregon institutions (Starlin and Lallas) that there is a higher proportion favorable among the faculty than among students in the same institution.

A subtle change occurs in proportion favorable to ETV as the nature of the question asked is changed. When students are asked to express their opinion about television as used in a particular course they are then taking, the proportion who are favorable is lower than the students who respond positively to "instructional television in general." (See TABLE 2.) Furthermore, as was indicated in TABLE 1, students were more positive in their evaluation of television in general after taking a TV course than before they took such a course.

Table 2

STUDENTS ARE MORE FAVORABLE TOWARD ETV IN GENERAL THAN THEY ARE TOWARD THEIR PARTICULAR TELEVISED COURSES

QUESTION: *What do you think of instructional television as used in this course?**

				PROPORTION FAVORABLE TO ETV	
				Relation to TV Course	
Source-Study No.	Year of Study	Academic Institution	N	Midway %	After Taking %
213, pp. 83-86	1955-56	Penn. State U.	710	40	49
245, p. 60	1956-57	New York U.	337		51
271, p. 194	1957	Penn. State U.	121		45
231, p. 64	1957	Western Illinois U.	39	85**	
228, p. 26	1962	U. of Colorado	84		43
242, p. 93	1963	U. of Illinois	160		47

* See notes, Table 1.

** The list of standardized responses for this question contained no Neutral response category.

The difference between these two questions is in the evaluation of ETV in general rather than in the course being taken. For those with television instructional experience there is a more positive response to the more general question. It seems clear that respondents can focus on a variety of reasons why they may be less enchanted with a given course than they have an opportunity to do when asked to evaluate a medium in general. Perhaps this "bunching of gripes" may account for the decline in level of favorableness as the question becomes specific to a given educational experience. That this is not a general phenomenon leading to progressive deterioration of student favorableness as additional specific questions are asked is revealed in the analysis in the next section.

Contrasts Rather Than Preferences Make a Difference

There is a very useful distinction between asking somebody how he likes a given thing or situation, and asking him to express a preference between two or more things or situations. In the first instance the criterion of judgment is left indefinite while in the second instance the preference expressed is with regard to the paired items. It is probable that the paired comparison has considerable merit in evaluating two distinctive things like ETV and face-to-face instruction.

We have examined studies in which a comparative judgment was elicited from college students in three different ways. In the studies summarized in TABLE 3, students were asked to choose between a TV section or a conventional section of a particular course. Without further definition of what was meant by conventional, it is very clear from the numerous studies in which we find data that students definitely prefer the conventional over the TV section even if they have already had experience with ETV. We may, therefore, draw the conclusion that the student consumer is conservative with regard to his willingness to "buy" ETV as contrasted with "conventional" instruction.

In general, the circumstance under which ETV is utilized is that of serving as a replacement for the large lecture course. The usual teaching response to enrollment pressures is to go from small course to large lecture courses and to go from a discussion or discussion-lecture method to a more formal, and ultimately a lecture-only presentation. Given this as the immediate past history of how teaching methods are varied in response to increased student enrollments, it then becomes appropriate to ask students for their preference of ETV over a large lecture course, which is the teaching method and medium most likely to be replaced. In TABLE 4, this

Table 3

GIVEN A CHOICE BETWEEN A TELEVISED AND CONVENTIONAL COURSE, MOST STUDENTS DO NOT PREFER TELEVISION

QUESTION: *If you have the option next semester of enrolling in either a TV section or a conventional section of a particular course, which will you choose —other things being equal?**

			PREFERENCE FOR TV PRESENTATION			
Source-Study No.	Year of Study	Academic Institution	N	TV Group	Non-TV Group	N
251, pp. ii, v, ix	1956-57	Case Institute	?	4%		
	1957-58		154	7		
200, p. 18	1957	U. of Alabama	87	9	1%	188
238, pp. 17 & 19	1957	Oregon State U.	40	40	9	105
217, p. 35	1957	San Francisco St.	92	12**	8**	95
248, p. 24	1958	San Francisco St.	158	33		
210, p. 127	1958	U. of Illinois	52	27	8	60
244, p. 33	1958	Ohio State U.	133	30		
236, p.3	1959	Iowa State Teachers College	183	40		
	1964		?	13		
	1965		?	34		
274, p. 17	1963-64	U. of Miami	534	18	6	126

* The difference in the percentages between Preference for TV Presentation and 100% is represented by Preference for Conventional Presentation, Undecided, and Either One.

** The difference in the percentages between Preference for TV Presentation (on campus) and 100% is represented by Preference for TV Presentation (at home) and Preference for Conventional Presentation.

choice is offered to various samples of students. There is obviously a marked increase in preference for television as the instructional medium when it is contrasted with a large lecture rather than with the more amorphous "conventional" instructional procedures. It seems fair to conclude that when students are asked to make a choice between a televised and a conventional course they apparently envision a rather ideal type of conventional course as the basis for contrast. When given the more realistic definition of a conventional course as a large lecture course, the shift of opinion is in the direction of preference for the ETV alternative. In all the studies reported in TABLE 4 there is a substantial repsonse in the "makes no difference" categories. Hence, the preference for ETV defin-

Table 4

FACED WITH THE CHOICE BETWEEN A TELEVISED COURSE AND A LARGE LECTURE COURSE, STUDENTS MODIFY THEIR ATTITUDES IN FAVOR OF TELEVISION

QUESTION: *If you were given the option would you like to take this course in a live large lecture class or a small class by TV?**

			PREFERENCE FOR TV PRESENTATION			
Source-Study No.	Year of Study	Academic Institution	N	TV Group	Non-TV Group	N
212, p. 53	1954-55	Penn. State U.	34	53%	38%	21
213, pp. 75, 77, 78	1956-57	Penn. State U.	907	53		
245, p. 60	1956-57	New York U.	337	49		
224, p. 47	1957-58	L.A. jr. colleges	?	92**	62**	?
242, p. 92	1960	U. of Illinois	96	53		
	1961		235	46		
	1962		254	37		
270, p. 25	1962	Ore. institutions	48	63		
214, p. 10	1964	U. of Minnesota	733	44		
216, p. 18	1966	Michigan St. U.	6005	50		

* See first note, Table 3.

** Students in this study were required to make a more rigorous choice. The question was: "If you had to choose between a TV class like this (i.e., of not over 80 enrollment) and a large lecture hall class of, say, 250 enrollment, not on TV, which would you choose and why?"

itely outweighs the preferences for a large lecture course when this choice is offered the students.

We have another kind of contrast in which the realistic possibility of getting an exceptionally good lecturer to present an ETV course is offered to the students in comparison with an instructor of uncertain quality teaching a conventional course. The data on this choice are presented in TABLE 5. The results of this comparison are overwhelmingly in favor of the ETV choice. This suggests two things: (1) that the medium in and of itself is not the basic concern of students in choosing among alternatives for their own instruction; and (2) that students seem to have a distinct preference for quality instruction. The Carpenter and Greenhill study[7]

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[7] C. R. Carpenter and L. P. Greenhill, *Instructional Television Research, Report No. Two.* (University Park: The Pennsylvania State University, Spring, 1958), p. 83.

Table 5

IF STUDENTS FEEL THEY CAN GET A BETTER LECTURER ON TV, THEY WILL CHOOSE THE TELEVISED PRESENTATION

QUESTION: *Suppose the TV section was to be taught by an excellent instructor whereas you would have to take a chance on instructor assignment in the conventional section, which would you choose?*

Source-Study No.	Year of Study	Academic Institution	PREFERENCE FOR TV PRESENTATION N	%
245, p. 60	1956-57	New York U.	337	72
251, pp. ii, v, ix	1956-57	Case Institute	?	53
	1957-58		154	58
238, p. 17	1957	Oregon State U.	40	82
248, p. 24	1958	San Francisco State	158	77
270, p. 19	1962	Oregon institutions	49	90
208, pp. i, 15, 22	1963-64	U. of Miami	180	61
274, p. 12	1963-64	U. of Miami	543	48
216, p. 18	1966	Michigan State U.	6005	60

* See first note, Table 3.

has suggested the conclusion that "...a gradual but pervasive opinion is developing among students that when they take TV courses they have a good chance of getting the best instructor(s) that a department can provide." Further support of the notion that ETV provides quality instruction is evident in the data presented in the last chapter which indicate considerably more time is devoted to preparing a TV presentation than is apparently involved in an ordinary, live classroom presentation.

We may now conclude that while the general attitudes regarding educational television tend to be favorable, the more specific attitudes where actual choices among media are offered are even more favorable. Apparently the student as a consumer of teaching has pretty good notions of bases upon which he makes his evaluations. Put another way, the processes of choosing and preferring require realistic grounds for evaluating alternatives. College students apparently have these realistic grounds and use them in judging their own liking for educational television versus face-to-face instruction.

Action Is the Preference

The expression of preferences for choices before the choices are actually made leaves open the question of whether the behavior that is preferred will actually occur. This, of course, is the standard problem of all attitude research designed to provide the empirical base for guessing or estimating subsequent behavior of a group.

The only study that made a direct attack upon this problem was the early Carpenter and Greenhill study. To quote their own description of the procedure:

> In an effort to surmount the shortcomings of verbal responses to attitude questions the TV Project developed a "behavioral choice procedure." Under this procedure students were given periods of both direct and televised instruction in the same course by the same instructor and were then required to choose between TV and direct instruction for the remainder of the semester. By obtaining students' verbal preferences before the behavioral choice was offered some interesting comparisons can be made between verbal choices and overt behavior.[8]

The data from this study are presented in TABLE 6. In the two instances where the verbal and behavioral choices are contrasted it is clear that the behavioral choice to proceed for the remainder of the semester with TV instruction occurred more frequently than what was indicated by the verbal choice for this same course of action.

Table 6

STUDENTS PREFER TELEVISED INSTRUCTION MORE THAN THEY SAY THEY DO*

Course	N	PREFERENCE FOR TELEVISED PRESENTATION	
		Verbal Choice	Behavioral Choice
Chemistry	589		32%
Business Law	144	42%	47
Political Science	219	51	70

* 213, pp. 74-77, (Tables 78, 79).

We may interpret these data to suggest that "actions speak louder than words." Furthermore, the actions that are revealed in this limited body of data are more favorable to ETV than the verbal choices which preceeded the action. There may very well be found here a consumer reaction similar to a user reaction. It will be recalled that after a professor used ETV, his attitude was more positive toward it. (see footnote 5, CHAPTER

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[8] *Ibid.*, pp. 73-74.

2). For the students as consumers it would appear that after they experienced ETV the percentage who were willing to take more of it was greater, even though that was not what they thought they would do prior to the actual choice (see also TABLES 3 and 4 of this chapter).

Effects of ETV

At two different levels the student body has been polled to determine its evaluation of effects of ETV. In a wide variety of academic institutions, those who have experienced television instruction were asked to determine whether they learned as much as they would have learned in a conventionally taught course. The data are displayed in TABLE 7.

It is notable that when we add together the categories "learned more from TV" and "learned about the same as conventional courses," in the majority of instances the sum of the results represents a majority of the respondents. Thus, those students with ETV experience seem to feel that their learning is not impeded by the medium employed. In the 1957-59 Oregon study and the 1964 Minnesota study it is possible to compare the student evaluation of student learning with that of their faculty. A comparison of the results in TABLE 7 with those in TABLE 25 of the previous chapter indicates that the proportion of students experiencing ETV in these two schools who say they learn as much or more by this method than by conventional instruction is higher than the proportion of their professors giving the same responses. Consumers appear to be more favorable than users on this point.

It is generally assumed that in order for effective teaching to take place, the student has to give his attention to the instructional process. It was therefore natural for those making studies of ETV to be curious about student response to the question of whether television held their attention during the instructional period. The data from several studies are shown in TABLE 8.

Apparently students were not all certain that their attention was as riveted upon the TV screen as it would have been upon a live professor. The data are not consistent in revealing basic trends although the studies may be divided between those in which the results show a proponderence of response favoring the attention-commanding features of ETV and those of a smaller group of studies in which the findings reveal students' belief in the greater power of face-to-face instruction to command their attention. In one observational study of student attentiveness in televised classes it was found that most students were continually attentive accord-

Table 7

MOST STUDENTS FEEL THEY LEARN AT LEAST AS MUCH FROM A TELEVISED COURSE AS THEY DO FROM A CONVENTIONAL COURSE

Question: *Do you think you learned as much over TV as you would have learned in a conventionally taught course with the same instructor?**

Source-Study No.	Year of Study	Academic Institution	COMPARATIVE LEARNING FROM TV		
			N	More	Same
212, p. 48	1954-55	Penn. State U.	330	18%	45%
257, p. 543	1956	Purdue U.	46		19**
251, pp. i, iv, viii	1956-57	Case Institute	?	4	2
	1957-58		154	16	5
205, p. 22	1956-57	State U. of Iowa	85	40	28
230	1956-57	Fresno State College	80	48	44
258, p. 13	1957	Purdue U.	103		24**
231, p. 66	1957	Western Illinois U.	39	49	44
238, p. 18	1957	Oregon State U.	40	43	40
262, p. 21	1957-58	State U. of S. Dakota	57	25	65
265, p. 72	1957-59	Oregon State U.	156	22	49
		U. of Oregon	216	26	57
		Oregon Col. of Ed.	80	21	53
		Willamette U.	25	12	24
244, p. 32	1958	Ohio State U.	134		27**
248	1958	San Francisco State	158	11	41
202, p. 28	1959-63	U. of Oregon	153	14	33
270, p. 25	1962	Oregon institutions	49		71**
214, p. 11	1964	U. of Minnesota	733	19	31
220, p. 6	1967	San Jose State	96		71**

* The difference in the percentages between the sum of More and Same, and 100% is represented by Less, Undecided and no response.

** These studies did not include within their standardized response categories the possibility that students could learn more in a televised class.

ing to the explicit measures employed. However, no measures were made in classes utilizing face-to-face instruction and comparative judgments are therefore not possible.[9]

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[9] See George Timmons, "Inter-institutional Teaching by Television in the Oregon State System of Higher Education, Report Number 7—1961-1962," (Eugene, Ore.: Oregon State System of Higher Education, 1965).

Table 8

THE ATTENTION-COMMANDING FEATURE OF ETV IS VARIABLE IN STUDENTS' EYES

QUESTION: *Do you think your attention was held to the same degree in the TV class as it would have been held in the conventional class?**

Source-Study No.	Year of Study	Academic Institution	COMPARATIVE ATTENTION (INTEREST) IN TV PRESENTATION		
			N	More	Same
212, p. 49	1954-55	Penn. State U.	329	28%	24%
257, p. 543	1956	Purdue U.	46		7**
251, pp. i, iv, viii	1956-57	Case Institute	?	15	23
	1957-58		154	20	4
230	1956-57	Fresno State College	82	55	26
258, p. 13	1957	Purdue U.	103		22**
231, p. 67	1957	Western Illinois U.	38	82	13
238, p. 18	1957	Oregon State U.	40	57	38
248, p. 27	1958	San Francisco State	158	23	27
202, p. 28	1959-63	U. of Oregon	153	15	17
270, p. 25	1962	Oregon institutions	50		72**

* See first note, Table 7.

** These studies did not include within their standardized response categories the possibility that students could be more attentive in a televised class.

College Students, Like Barkus, Are Willing

The general conclusion regarding students' orientation toward educational television is that they are indifferent to considerations of media and method of instruction. The desires they do have about teaching are that the quality be high and the instructors be competent.

College students prefer that method or medium of instruction to which they are currently being subjected. On the whole, they respond favorably to the prospects of ETV, and even more favorably after they have experienced educational television. When forced to make realistic choices between ETV and that medium which it is likely to replace, large and impersonal lecture courses, college students accept educational television as a viable alternative. Furthermore, the quality of instruction apparently carries more weight than the medium itself in the choices students are willing to make if they are guaranteed high quality on TV versus the usual "lucking out" blind choice of conventional instruction during registration. Finally, it is clear from the assembled data that when students are afforded the opportunity to select TV or conventional instruction, they choose television instruction more frequently than they have said they would.

The college student as consumer of teaching does not exhibit any significant resistance to the introduction of educational television in his own instructional program. He will take whatever method or medium of instruction is offered, damn or praise it on its merits, and get on with the business of pursuing his college education.

CHAPTER

4

ETV—The Tool

ETV is a distinctive medium of instruction, but it is also a tool of teaching, notable for its complex technology. Measured by the results produced, there is no reason to believe that educational television at the college level is either better or worse than the conventional face-to-face medium of instruction it replaces. We therefore need a framework within which to orient educational decisions regarding the utilization of ETV at the college level.

Educational Issue

There is no significant educational issue involved in the use of ETV. In another study we demonstrated that, however widely the methods of college instruction vary, there are no measurable outcomes in student performance that differentiate among the methods.[1] In CHAPTER 1 we have also demonstrated that educational television as a distinctive medium of instruction appears to be as good as the face-to-face medium of instruction. ETV is measurably inferior to face-to-face instruction only when the former tries to replicate the latter—that is, in two-way instructional television. When the special qualities of the television medium are maximized, it is clear that the medium is effective in college teaching. When television instruction tries to be like face-to-face instruction it succeeds in being only a poor substitute. Obviously, the common prejudice in favor of face-to-face instruction is the source of pressure which has been exerted to make ETV comparable to face-to-face instruction. This does not seem to be the road down which ETV enthusiasts should go.

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[1] Robert Dubin and Thomas C. Taveggia, *The Teaching-Learning Paradox: A Comparative Analysis of College Teaching*, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1968).

Technical Innovation

We have distinguished between users of the ETV medium and its consumers. This distinction turns out to be extremely important in understanding where the acceptance of the new medium of instruction is greatest and where opposition to it is likely to develop.

The students as consumers of television instruction are willing to accept it if the content of instruction is of average or better quality. There is absolutely no reason to believe that as of right now college students would be anything but acceptant consumers of ETV. Furthermore, in the future, as the generations of college students have had more and more experience with televised instruction in grade and high school, the student culture will expect it as a normal feature of the instructional environment. Indeed, there might well be surprise that television is not used, or used so little, at the college level.

Resistance to the spread of educational television at the college level may be said to be centered in the user group—the professors. However, it should be noted that this resistance to using ETV is highly personalized. That is to say, individual professors would not themselves be willing to teach on television but there is no evidence to indicate that they would actively oppose others using the medium.

There appears, therefore, to be an individual rather than a collective distaste for college-level television instruction. This turns out to be an extremely important consideration in determining college policy regarding educational television. It means that those professors who are opposed to personal utilization of the television medium do not have to become TV performers. In every faculty there are ETV enthusiasts or experimentally-minded professors who are willing to give the new medium a try. It is, after all, quite clear that the few professors who use ETV can reach a student audience of unlimited numbers in dispersed locations unrestricted by day or time of day. It takes just the few to teach as large a student body as may be enrolled in ETV courses.

The obvious administrative implication of the individualized opposition by the user group to educational television is that no broad consensus is required among a faculty in order to initiate and continue to utilize ETV. Indeed, the faculty group, must, to be true to its commitment to academic freedom, permit any professor or group of professors to utilize educational television, because to do otherwise would be an invasion of *their* freedom in the classroom. This is a good example where consistency in an ideology and the commitment to it will provide the rationale for significant technical innovation in college teaching.

Organizational Issues

The problem of meeting growing student enrollments at the undergraduate level is the central organizational issue to which the use of educational television is directed. Obviously, ETV is a very effective means for teaching large numbers of students with minimum faculty investment. If the dire predictions of faculty shortage in the future are realized, then ETV provides a viable and constructive means of avoiding the attendant problems of such a shortage. It should be noted, to the discomfort of the vocal opponents of educational TV at the college level, that the preservation of the face-to-face medium of instruction for college students has largely been accomplished up to the present time by a vast utilization of graduate teaching assistants in the classroom.[2] The face-to-face medium of instruction has been slowly but relentlessly modified by accomodating the undergraduate students, and especially the lower division student, with a graduate student "professor."

The attention of the academic community has been focused primarily on the short-term problem of meeting the pressure of increasing student enrollments. We would like here to pose a long-term issue that is relevant to college-level ETV—the problem of the potential "redundancy" of college professors as teachers. (In European usage, redundancy means technological unemployment.)

It is perfectly clear that instructional television, including the rebroadcast video tapes, makes theoretically possible the selection of the very best teachers in a given area or subject, country-wide, (or even worldwide) to teach in perpetuity via video tape wherever broadcast equipment is available. This is not an idle vision because there are already commercial firms putting such distinguished educators as Arthur Schlesinger and John Galbraith on video tape. A vigorous policy of maximum utilization of college-level educational television could pose an immediate and permanent threat to the teaching employment of college professors.

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[2] Cf. Robert Dubin and Fredric Beisse, "The Assistant: Academic Subaltern," *Administrative Science Quarterly*, 11, 1967, pp. 521-47.

That this threat is neither obvious nor imminent results from a combination of interesting factors. First and foremost is the pervasive belief that the only method of college instruction is through the face-to-face medium. Once this is accepted as an article of faith, then the growth of the faculty needs to have a functional linkage to the growth of the student body. For all the faces in front of the podium there has to be one or more behind it. From this viewpoint the obvious problem is that of teacher shortage, not professor redundancy.

There are limits to which warm bodies may be continually drawn into the market of college-level teachers. In American higher education we have already come dangerously close to fulfilling a Gresham's Law of teaching. The largest single group of warm bodies recruited to the classroom lectern has consisted of teaching assistants drawn from among first, second, and third year graduate students. "Cheap" teaching has indeed driven "dear" teaching from the undergraduate college classroom.

A second factor sustaining a belief in present and future teacher shortages is a "touch-me" philosophy among some college students who believe that education involves some sort of professorial "laying on of the hands." Students who espouse this point of view are likely to object to the large, impersonal lecture course, and object even more to a TV instructional medium because the opportunity for personally being touched by the professor is lost.

These two belief systems supporting the conclusion that we need ever more teachers in the college classroom have been so completely institutionalized that there is little likelihood of their abrupt displacement. In short, the potential of ETV to produce redundancy in the professor's teaching function is not likely to be realized immediately.

At the same time, of course, the Gresham's Law of teaching quality at the undergraduate level provides the goad for college administrators and decision makers to view with some favor experimenting with alternate methods and media of instruction. There is, therefore, pressure to try ETV even though it appears to violate some of the sacred beliefs about college instruction.

The educational decision maker, in balancing the belief in the sacredness of the face-to-face teaching medium against the loss of instructional quality due to low quality instructors has at his disposal appropriate mechanisms for achieving a proper balance. These mechanisms are the reward systems that have special relevancy to the television instructor.

If the educational decision maker concludes that it is desirable to encourage television instruction in his college or university, he may start with the fairly certain knowledge that at least enough of his faculty are inclined to give it a try to provide a willing and able instructional group. To encourage their commitment, the college administrator has several forms of incentive at his disposal.

Perhaps most important as an incentive to engage in television teaching is an appropriate valuation of the teaching load represented. We have already examined the evidence that a considerably greater amount of time is invested in each contact hour of instruction when the medium is television. Furthermore, it is the opinion of television instructors that, for a variety of reasons, they should be given more credit in their total teaching load calculations for each television contact hour than for each hour in face-to-face instruction. By satisfying these expectations there is no doubt that considerable incentive would be offered to potential television teachers.

A second incentive would be an equitable solution to the problem of replaying video tapes. This is a knotty multi-faceted problem but the commercial television industry offers one workable solution to the rebroadcast problem. Perhaps this might serve as some kind of a model for the recompense of professors for rebroadcast of their performances.

A third incentive of a somewhat different quality is also available to administrators. Our data show that professors, by and large, do not believe that teaching by television literally constrains their performance or invades their academic freedom. Nevertheless, reassurances on this score by administrators to potential TV instructors might provide an added incentive to undertake this medium of instruction.

There are obviously other incentives that may be employed in monitoring the rate of introduction of ETV. We have suggested only three in order to illustrate the fact that educational decision makers do have means, other than persuasion and the establishment of a consensus, to influence the employment of a new medium of instruction.

Accordingly, we view the educational decision maker and the college administrator as functioning in a control capacity to encourage or discourage the rate at which educational television spreads in college and university instruction. The fundamental policy decision for the administrator is how to balance the teacher shortage due to the commitment to the face-to-face teaching medium against the teacher redundancy that could very well result from adopting educational television. Wherever this balance is struck, the academic decision maker may then employ the appropriate amounts of available incentives to achieve his chosen balance point.[3]

To summarize, we do not believe that there is an educational policy decision involved in utilzing ETV because the facts suggest it is neither any better nor worse than the medium of instruction it replaces in achieving results among students. The essential issue in ETV is to view it as a technical innovation. From this standpoint it seems clear that the major obstacle to adoption of the innovation lies among the user group—the professors. This group, however, is responsive to appropriate incentives and will utilize instructional television on an indvidual basis. The institutional impact of ETV on the college and university is its potential for creating redundancy in the professors' teaching functions. This is not necessarily an undesirable outcome because the proportional growth in research functions among professors will readily absorb their productive energies if displaced from their teaching functions.

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[3] We would guess, for example, that a likely point of balance would be to encourage vigorous utilization of ETV in the lower division courses of a college or university, thus creating redundancy among teaching assistants, at the same time retaining a strong commitment to face-to-face instruction at the upper division and graduate levels.

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